Vol. 897 Number 2

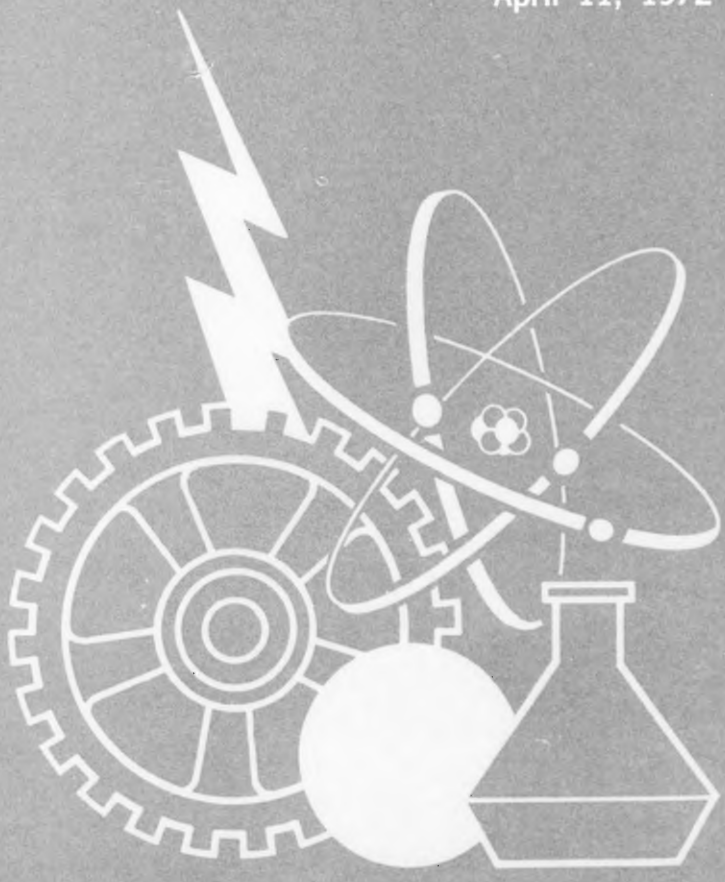
# OFFICIAL GAZETTE

of the
UNITED STATES PATENT OFFICE

A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

PATENTS

April 11, 1972



U. S. DEPARTMENT OF COMMERCE
Patent Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

April 11, 1972 Volume 897 Number 2

# CONTENTS

| | Page |
|---|---|
| Issue of April 11, 1971 | 385 |
| Patent Notices | |
| Certificates of Correction for the Week of April 11, 1972 | 386 |
| Dedications | 386 |
| Corrected Dedications | 386 |
| Disclaimers and Dedications | 386 |
| Condition of Patent Applications | 388 |
| Reissue Patents Granted | 389 |
| Plant Patents Granted | 393 |
| Patents Granted | |
| General and Mechanical | 395 |
| Chemical | 570 |
| Electrical | 669 |
| Design Patents Granted | 742 |
| Index of Patentees | PI 1 |
| Indices of Reissues, Plants, and Designs | PI 48 |
| Classification of | |
| Patents (Including Reissues) | PI 51 |
| Designs and Plants | PI 54 |
| Geographical Index of Residence of Inventors | |
| Patents (Including Reissues) | PI 55 |
| Designs and Plants | PI 57 |

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# PATENT OFFICE NOTICES

## Certificates of Correction for the Week of Apr. 11, 1972

| | | | |
|---|---|---|---|
| 3,317,443 | 3,587,047 | 3,603,571 | 3,613,463 |
| 3,411,353 | 3,587,161 | 3,603,698 | 3,613,547 |
| 3,479,467 | 3,587,587 | 3,603,759 | 3,613,636 |
| 3,505,350 | 3,589,495 | 3,603,938 | 3,613,689 |
| 3,516,828 | 3,589,508 | 3,603,972 | 3,613,951 |
| 3,520,982 | 3,590,452 | 3,604,065 | 3,613,960 |
| 3,521,987 | 3,591,254 | 3,604,082 | 3,614,275 |
| 3,523,433 | 3,591,286 | 3,604,136 | 3,614,320 |
| 3,527,504 | 3,591,549 | 3,604,191 | 3,614,591 |
| 3,528,403 | 3,591,869 | 3,604,497 | 3,614,657 |
| 3,539,679 | 3,592,001 | 3,604,803 | 3,614,686 |
| 3,540,875 | 3,592,489 | 3,604,895 | 3,614,775 |
| 3,545,199 | 3,592,810 | 3,605,005 | 3,615,024 |
| 3,547,245 | 3,593,003 | 3,605,973 | 3,615,282 |
| 3,547,346 | 3,593,287 | 3,607,008 | 3,615,298 |
| 3,547,844 | 3,593,761 | 3,607,075 | 3,615,329 |
| 3,547,912 | 3,593,848 | 3,607,346 | 3,615,360 |
| 3,557,737 | 3,594,478 | 3,607,365 | 3,615,674 |
| 3,560,146 | 3,594,623 | 3,607,421 | 3,615,707 |
| 3,560,678 | 3,595,918 | 3,607,441 | 3,615,803 |
| 3,562,491 | 3,596,206 | 3,607,458 | 3,615,976 |
| 3,568,168 | 3,596,420 | 3,607,462 | 3,616,308 |
| 3,570,440 | 3,596,501 | 3,607,574 | 3,617,029 |
| 3,570,622 | 3,596,652 | 3,607,642 | 3,617,037 |
| 3,573,841 | 3,597,219 | 3,607,692 | 3,617,269 |
| 3,574,381 | 3,597,362 | 3,607,699 | 3,617,320 |
| 3,574,389 | 3,597,410 | 3,607,819 | 3,617,382 |
| 3,575,097 | 3,597,525 | 3,607,871 | 3,617,550 |
| 3,575,624 | 3,597,851 | 3,607,930 | 3,617,689 |
| 3,576,309 | 3,597,960 | 3,608,559 | 3,617,827 |
| 3,578,685 | 3,599,633 | 3,608,604 | 3,617,981 |
| 3,578,689 | 3,599,868 | 3,608,647 | 3,618,094 |
| 3,578,976 | 3,600,223 | 3,608,882 | 3,618,399 |
| 3,580,113 | 3,600,379 | 3,609,475 | 3,619,062 |
| 3,580,735 | 3,600,606 | 3,609,530 | 3,619,267 |
| 3,581,325 | 3,600,882 | 3,609,666 | 3,619,272 |
| 3,582,548 | 3,601,172 | 3,609,667 | 3,619,281 |
| 3,582,884 | 3,601,267 | 3,610,302 | 3,619,408 |
| 3,584,153 | 3,601,529 | 3,610,368 | 3,619,734 |
| 3,584,204 | 3,602,013 | 3,610,500 | 3,619,842 |
| 3,584,785 | 3,602,138 | 3,610,819 | 3,619,895 |
| 3,585,398 | 3,602,326 | 3,611,390 | 3,621,911 |
| 3,585,514 | 3,602,655 | 3,611,969 | 3,622,783 |
| 3,585,547 | 3,602,688 | 3,612,066 | 3,622,807 |
| 3,585,864 | 3,602,728 | 3,612,087 | 3,622,914 |
| 3,586,439 | 3,602,787 | 3,612,264 | 3,624,506 |
| 3,586,486 | 3,602,980 | 3,612,915 | |
| 3,586,823 | 3,603,105 | 3,613,091 | |
| 3,586,837 | 3,603,419 | 3,613,143 | |

## Dedications

3,496,088.—*Jean Pfau,* Geneva and *Heinz Rhyner,* Meyrin-Geneva, Switzerland. ELECTROLYTIC MACHINING APPARATUS. Patent dated Feb. 17, 1970. Dedication filed Dec. 23, 1971, by the assignee, *Anocut Engineering Company.*

Hereby dedicates to the Public the portion of the term of the patent subsequent to Dec. 24, 1971.

---

3,520,791.—*Jean Pfau,* Geneva, *Heinz Rhyner,* Meyrin-Geneva, and *Georges Marendaz,* Geneva, Switzerland. PROTECTIVE CIRCUIT FOR ELECTROLYTIC MACHINING APPARATUS. Patent dated July 14, 1970. Dedication filed Dec. 23, 1971, by the assignee, *Anocut Engineering Company.*

Hereby dedicates to the Public the portion of the term of the patent subsequent to Dec. 24, 1971.

3,536,603.—*Benno Ibo Bonga,* Onex, Geneva, Switzerland. ELECTRICAL CONNECTORS TO A WORKPIECE IN ELECTRO-EROSION MACHINES. Patent dated Oct. 27, 1970. Dedication filed Dec. 23, 1971, by the assignee, *Anocut Engineering Company.*

Hereby dedicates to the Public the portion of the term of the patent subsequent to Dec. 24, 1971.

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3,561,213.—*Samuel Shiber,* Chicago, Ill. DUAL RATIO MASTER CYLINDER. Patent dated Feb. 9, 1971. Dedication filed Jan. 21, 1972, by the assignee, *Borg-Warner Corporation.*

Hereby dedicates to the People of the United States the entire remaining term of said patent.

---

## Corrected Dedication

2,715,599.—*John F. Les Veaux,* Middleport, and *Calvin M. Tidwell,* Medina, N.Y. METHOD OF MAKING INSECTICIDAL CALCIUM ARSENATE BATCH. Patent dated Aug. 16, 1955. Dedication filed Nov. 4, 1971, by the assignee *FMC Corporation.*

Hereby dedicates to the Public the remaining term of said patent.

---

## Disclaimers and Dedications

3,416,772.—*William C. Sheehan,* Bartlesville, Okla. METHOD OF FIBRILLATION. Patent dated Dec. 17, 1968. Disclaimer and dedication filed Dec. 28, 1971, by the assignee, *Phillips Petroleum Company.*

Hereby disclaims said patent and dedicates to the Public the remaining term of said patent.

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3,423,888.—*Claude V. Brown,* Bartlesville, Okla. FIBRILLATION. Patent dated Jan. 28, 1969. Disclaimer and dedication filed Dec. 28, 1971, by the assignee, *Phillips Petroleum Company.*

Hereby disclaims said patent and dedicates to the Public the remaining term of said patent.

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3,424,358.—*Leroy E. Robinson* and *Dan E. Perry,* Bartlesville, Okla. METHOD FOR PRODUCING FIBRILLATED FILM. Patent dated Jan. 28, 1969. Disclaimer and dedication filed Dec. 28, 1971, by the assignee, *Phillips Petroleum Company.*

Hereby disclaims said patent and dedicates to the Public the remaining term of said patent.

---

3,431,875.—*Harold D. Boultinghouse,* Bartlesville, Okla. TUFTED ARTICLES AND METHOD FOR MAKING SAME. Patent dated Mar. 11, 1969. Disclaimer and dedication filed Dec. 28, 1971, by the assignee, *Phillips Petroleum Company.*

Hereby disclaims said patent and dedicates to the Public the remaining term of said patent.

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3,460,416.—*Dixie E. Gilbert,* Bartlesville, Okla. FIBRILLATION METHOD. Patent dated Aug. 12, 1969. Disclaimer and dedication filed Dec. 28, 1971, by the assignee, *Phillips Petroleum Company.*

Hereby disclaims said patent and dedicates to the Public the remaining term of said patent.

3,473,206.—*Harold D. Boultinghouse,* Bartlesville, Okla. FIBRILLATION. Patent dated Oct. 21, 1969. Disclaimer and dedication filed Dec. 28, 1971, by the assignee, *Phillips Petroleum Company.*

Hereby disclaims said patent and dedicates to the Public the remaining term of said patent.

3,478,142.—*Max E. Greene,* Bartlesville, Okla. METHOD OF PLEATING AND STRETCHING PLASTIC FILM. Patent dated Nov. 11, 1969. Disclaimer and dedication filed Dec. 28, 1971, by the assignee, *Phillips Petroleum Company.*

Hereby disclaims said patent and dedicates to the Public the remaining term of said patent.

3,490,663.—*Bradley Skinner,* Bartlesville, Okla. FIBRILLATION. Patent dated Jan. 20, 1970. Disclaimer and dedication filed Dec. 28, 1971, by the assignee, *Phillips Petroleum Company.*

Hereby disclaims said patent and dedicates to the Public the remaining term of said patent.

3,490,664.—*Harold D. Boultinghouse,* Bartlesville, Okla. RECIPROCATING PLASTIC FILM SPLITTER. Patent dated Jan. 20, 1970. Disclaimer and dedication filed Dec. 28, 1971, by the assignee, *Phillips Petroleum Company.*

Hereby disclaims said patent and dedicates to the Public the remaining term of said patent.

3,491,928.—*Harold D. Boultinghouse,* Bartlesville, Okla. FIBRILLATION OF ORIENTED FILM. Patent dated Jan. 27, 1970. Disclaimer and dedication filed Dec. 28, 1971, by the assignee, *Phillips Petroleum Company.*

Hereby disclaims said patent and dedicates to the Public the remaining term of said patent.

3,511,901.—*Claude V. Brown,* Bartlesville, Okla. FIBRILLATION OF PLASTIC FILM. Patent dated May 12, 1970. Disclaimer and dedication filed Dec. 28, 1971, by the assignee, *Phillips Petroleum Company.*

Hereby disclaims said patent and dedicates to the Public the remaining term of said patent.

3,541,197.—*James K. Hughes,* Bartlesville, Okla. PRODUCTION OF NET-LIKE STRUCTURES. Patent dated Nov. 17, 1970. Disclaimer and dedication filed Dec. 28, 1971, by the assignee, *Phillips Petroleum Company.*

Hereby disclaims said patent and dedicates to the Public the remaining term of said patent.

3,548,048.—*James K. Hughes* and *Jake E. Williams,* Bartlesville, Okla. METHOD OF PRODUCING POLYMERIC ARTICLES RESISTANT TO FIBRILLATION. Patent dated Dec. 15, 1970. Disclaimer and dedication filed Dec. 28, 1971, by the assignee, *Phillips Petroleum Company.*

Hereby disclaims said patent and dedicates to the Public the remaining term of said patent.

3,554,419.—*Leroy E. Robinson* and *Dan E. Perry,* Bartlesville, Okla. NONWOVEN FABRICS. Patent dated Jan. 12, 1971. Disclaimer and dedication filed Dec. 28, 1971, by the assignee, *Phillips Petroleum Company.*

Hereby disclaims said patent and dedicates to the Public the remaining term of said patent.

3,566,735.—*Max E. Greene,* Spartanburg, S.C. FIBRILLATION. Patent dated Mar. 2, 1971. Disclaimer and dedication filed Dec. 28, 1971, by the assignee, *Phillips Petroleum Company.*

Hereby disclaims said patent and dedicates to the Public the remaining term of said patent.

3,577,724.—*Max E. Greene,* Bartlesville, Okla. METHOD OF FIBRILLATING AND TWISTING ORIENTED FILM. Patent dated May 4, 1971. Disclaimer and dedication filed Dec. 28, 1971, by the assignee, *Phillips Petroleum Company.*

Hereby disclaims said patent and dedicates to the Public the remaining term of said patent.

3,579,618.—*Dan F. Stewart, Bob C. Blair, Max E. Greene,* and *Lloyd R. Alexander,* Bartlesville, Okla. HIGH SPEED FIBRILLATION PROCESS. Patent dated May 18, 1971. Disclaimer and dedication filed Dec. 28, 1971, by the assignee, *Phillips Petroleum Company.*

Hereby disclaims said patent and dedicates to the Public the remaining term of said patent.

3,596,816.—*Claude V. Brown,* Bartlesville, Okla. FIBRILLATION METHOD. Patent dated Aug. 3, 1971. Disclaimer and dedication filed Dec. 28, 1971, by the assignee, *Phillips Petroleum Company.*

Hereby disclaims said patent and dedicates to the Public the remaining term of said patent.

# PATENT EXAMINING CORPS

**R. A. WAHL, Assistant Commissioner**
**F. H. BRONAUGH, Deputy Assistant Commissioner**

## CONDITION OF PATENT APPLICATIONS AS OF MARCH 21, 1972

| PATENT EXAMINING GROUPS | Actual Filing Date of Oldest New Case Awaiting Action |
|---|---|
| **CHEMICAL EXAMINING GROUPS** | |
| GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices. | 1-11-71 |
| GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides. | 9-04-70 |
| HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes. | 1-25-71 |
| COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography. | 2-01-71 |
| SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods: Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes. | 10-01-70 |
| **ELECTRICAL EXAMINING GROUPS** | |
| INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous. | 7-21-71 |
| SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material. | 2-11-71 |
| INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts. | 3-03-71 |
| ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring. | 4-01-71 |
| PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments. | 1-06-71 |
| DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts. | 1-06-71 |
| **MECHANICAL EXAMINING GROUPS** | |
| HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages. | 2-03-71 |
| MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks. | 1-08-71 |
| AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination. | 1-04-71 |
| HEAT, POWER AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing. | 3-17-71 |
| CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling. | 2-03-71 |

**Expiration of patents:** The patents within the range of numbers indicated below expire during April 1972, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,705,322 to 2,707,276, inclusive
Plant Patents..... Numbers 1,374 to 1,388, inclusive

# REISSUES

APRIL 11, 1972

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

## 27,325

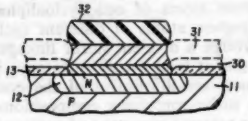
## MULTILEVEL OHMIC CONTACTS FOR SEMICONDUCTOR DEVICES

James A. Cunningham, Houston, and Robert P. Williams, Plano, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Original No. 3,341,753, dated Sept. 12, 1967, Ser. No. 405,461, Oct. 21, 1964. Application for reissue Sept. 12, 1969, Ser. No. 862,993

Int. Cl. H01l *5/02*

U.S. Cl. 317—232 R 13 Claims




A multilevel expanded ohmic contact to a semiconductor device where the ohmic contact includes a molybdenum film and an overlying layer of highly conductive metal as aluminum. The molybdenum and aluminum films may be deposited by evaporation techniques described herein.

## 27,326

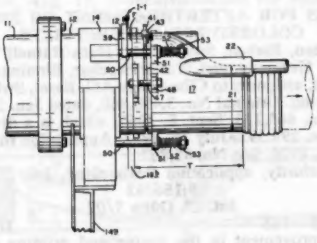
## TRUNNION VALVE FOR CONTINUOUS ROTARY FILTER

John A. Sheaffer, South Norwalk, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Original No. 3,455,454, dated July 15, 1969, Ser. No. 692,085, Dec. 20, 1967. Application for reissue Oct. 1, 1969, Ser. No. 868,248

Int. Cl. B01d *33/08, 33/06, 33/02*

U.S. Cl. 210—91 42 Claims



Improved trunnion valve for rotary filters providing a bridge plate assembly having simple and compact means for adjusting the bridge blocks from the outside, thereby varying the extent and location of respective operating zones of the filtration cycle without necessitating the dismounting of the valve.

## 27,327

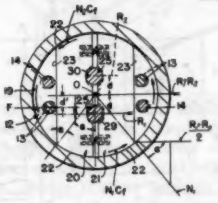
## BALANCED BI-DIRECTIONAL NO-BACK MECHANISM

Ilmars Kalns, Taylor, Mich., assignor to Formsprag Company, Warren, Mich.

Original No. 3,414,095, dated Dec. 3, 1968, Ser. No. 605,872, Dec. 29, 1966. Application for reissue Dec. 2, 1969, Ser. No. 881,400

Int. Cl. F16d *67/00, 51/04*

U.S. Cl. 192—8 3 Claims



A no-back type clutch or anti-feed-back or torque transmitting mechanism is disclosed which has two brake shoes normally urged in a direction to engage a cylindrical brake drum surface, but separated from the latter by the action of driving pins on a power input member. The output member has driven and reaction transmitting pins extending between the brake shoes; and in response to an excessive torque load the output pins spread the shoes into braking engagement with the drum surface, thus limiting the feed back of torque to the input. The output pins react against the shoes on a greater length moment arm than do the input pins, with a resultant couple-balancing effect.

## 27,328

## THERMOSETTING RESINS DERIVED FROM N-3-OXOHYDROCARBON-SUBSTITUTED ACRYLAMIDES

John Wesley Forsberg, Mentor-on-the-Lake, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

No Drawing. Original No. 3,518,326, dated June 30, 1970, Ser. No. 826,006, May 19, 1969, which is a continuation-in-part of Ser. No. 619,565, Mar. 1, 1967. Application for reissue Oct. 9, 1970, Ser. No. 79,716

Int. Cl. C08g *37/38*

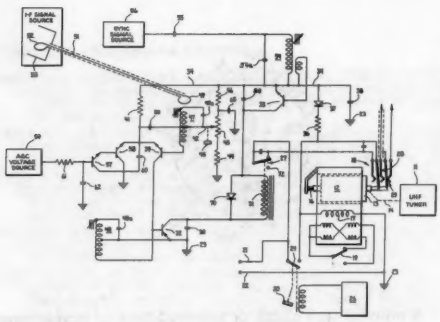
U.S. Cl. 260—828 21 Claims

A thermosetting polymeric composition is prepared by the reaction of an N-3-oxohydrocarbon-substituted acrylamide (preferably diacetone acrylamide) with an aliphatic aldehyde containing no more than 4 carbon atoms, preferably formaldehyde, in a strongly alkaline medium. While the structure of the composition is not known, it is believed to be a crosslinked product formed by hydroxymethylation and subsequent condensation through the hydroxymethyl groups. The acrylamide olefinic bonds are apparently unaffected. These compositions are useful either alone or in combination with unsaturated poly-

esters, for the preparation of thermosetting molding powders. They may also be used to replace polyesters (in full or in part) in typical applications such as production of resin-impregnated fiber glass mats and various kinds of laminates.

---

**27,329**
**SEARCH TUNE SYSTEM FOR TELEVISION RECEIVERS**
**Louis F. Mayle, Fort Wayne, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.**
**Original No. 3,388,215, dated June 11, 1968, Ser. No. 386,207, July 30, 1964. Application for reissue Apr. 24, 1970, Ser. No. 31,799**
**Int. Cl. H04n** *5/44*
**U.S. Cl. 178—5.8 R** **35 Claims**



An undetented tuner motor holding circuit with an electrically operable normally-closed switch therein. A switch control circuit having a pair of transistors in series therein, both normally non-conducting, one being activated in response to the I-F carrier, and the other being activated in response to a horizontal sync signal, simultaneous activation of both serving to open the motor hold circuit. A third transistor responsive to AGC level for controlling the one transistor in accordance with a sensitivity setting.

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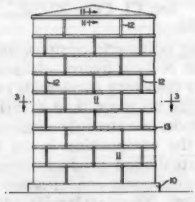
**27,330**
**THERMALLY INSULATED TANK STRUCTURE**
**Emil G. Marcmann, Medford, N.J. 08055**
**Original No. 3,456,835, dated July 22, 1969, Ser. No. 720,943, Apr. 12, 1968. Application for reissue June 3, 1970, Ser. No. 43,247**
**Int. Cl. B65d** *25/18*
**U.S. Cl. 220—9 F** **10 Claims**



An insulated tank structure comprising a plurality of panels having an insulating material secured thereto which are arranged about the outside walls of a tank structure and caused to retain its position thereon by means of a novel securing means which will permit for the expansion and contraction of the securing means and panels secured thereby due to temperature changes occurring within the tank structure.

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**27,331**
**SULFURIZED DIELS-ALDER ADDUCTS AND LUBRICANTS CONTAINING THE SAME**
**Lester Earl Coleman, Willoughby Hills, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio**
**No Drawing. Original No. 3,498,915, dated Mar. 3, 1970, Ser. No. 784,172, Dec. 16, 1968, which is a continuation-in-part of Ser. No. 657,520, Aug. 1, 1967, which in turn is a continuation-in-part of Ser. No. 602,600, Dec. 19, 1966. Application for reissue Nov. 16, 1970, Ser. No. 90,164**
**Int. Cl. C10m** *1/38;* **C07g** *17/100*
**U.S. Cl. 252—47.5** **24 Claims**

Sulfur-containing compositions characterized by the presence of at least one cycloaliphatic group with at least two nuclear carbon atoms of one cycloaliphatic group or two nuclear carbon atoms of different cycloaliphatic groups joined through a divalent sulfur linkage. The sulfur linkage contains at least two sulfur atoms. Sulfurized Diels-Alder adducts are illustrative of the compositions disclosed. These sulfur-containing compositions are particularly useful as extreme pressure and antiwear additives in various lubricating oils.

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**27,332**
**PERFUME COMPOSITIONS CONTAINING GERANONITRILE, CINNAMYL NITRILE OR 2-NONENYL NITRILE**
**Willard T. Somerville, Monmouth, N.J., and Edward J. Shuster, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.**
**No Drawing. Original No. 3,325,369, dated June 13, 1967, Ser. No. 335,071, Mar. 26, 1964, which is a continuation-in-part of Ser. No. 277,695, May 3, 1963. Application for reissue Mar. 23, 1970, Ser. No. 22,072**
**Int. Cl. A61k** *7/00*
**U.S. Cl. 252—522** **6 Claims**

*Compositions containing geranonitrile to impart thereto a citrusy lemon-like odor, but substantially free from discoloration and odor degradation. Such compositions may include soaps or detergents.*

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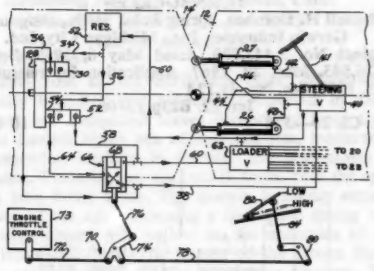
**27,333**
**PROCESS FOR AFTERTREATMENT OF FRESHLY COLORED POLYAMIDE FIBERS**
**Karl Soiron, Riehen, Switzerland, Hans Rafael, Weil am Rhein, Germany, and Walter Stockar, Binningen, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland**
**No Drawing. Original No. 3,490,860, dated Jan. 20, 1970, Ser. No. 665,223, Sept. 5, 1967, which is a division of Ser. No. 296,392, July 19, 1963. Application for reissue Sept. 1, 1970, Ser. No. 68,807**
**Claims priority, application Switzerland, July 31, 1962, 9,156/62**
**Int. Cl. D06p** *5/02*
**U.S. Cl. 8—165** **10 Claims**

An improvement in the dyeing and printing of polyamide fibers, comprising an an after-treatment the introduction of such fibers which have been freshly dyed or printed with a fiber reactive dyestuff, prior to the conventional drying, into an aqueous bath which contains certain halogenated organic products in combination with a certain kind of tertiary saturated aliphatic di-tri- or tetra-amine; the pH of the bath is adjusted to about 4 to 5.5, and the bath containing the fibers is then heated; also the aforesaid after-treatment baths per se.

## 27,334
## MULTIPLE SPEED HYDRAULIC CONTROL SYSTEM

Richard F. Zimmerman, Waukegan, Ill., assignor to International Harvester Company

Original No. 3,360,925, dated Jan. 2, 1968, Ser. No. 524,894, Feb. 3, 1966. Application for reissue June 2, 1969, Ser. No. 848,756
Int. Cl. F15b *11/16, 15/18*
U.S. Cl. 60—19 10 Claims



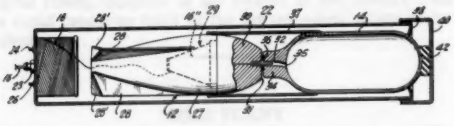

[A multiple speed hydraulic steering control system for a tractor loader vehicle with means responsive to a low speed engine throttle setting to direct a high rate of fluid flow to the control system and responsive to a high speed throttle setting to direct a low rate of fluid flow to the control system.]

*A multiple speed hydraulic steering and lifting control system for a tractor loader vehicle with means responsive to a low speed engine throttle setting to direct fluid flow for steering and lifting, respectively, at one disproportionate rate and responsive to a high speed engine throttle setting to direct fluid flow for steering and lifting, respectively, at a differing disproportionate rate. Specifically, steering receives its high rate of fluid flow at low engine speed and lifting receives its high rate of fluid flow at high engine speed, with each having available at least some flow full time.*

## 27,335
## AQUATIC PROBE

Samuel A. Francis, Marion, Mass., assignor to The Buzzards Corporation, Marion, Mass.

Original No. 3,349,613, dated Oct. 31, 1967, Ser. No. 389,434, Aug. 13, 1964. Application for reissue Aug. 15, 1969, Ser. No. 862,986
Int. Cl. G01c *13/00*
U.S. Cl. 73—170 A 16 Claims

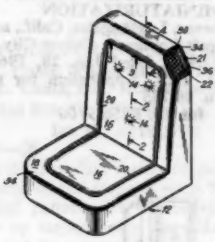


The present invention includes apparatus to be deployed from an underwater vessel, comprising a bathythermograph probe having a quantity of wire wound therein and having a negative buoyancy, a thermistor contained within the probe, a float assembly releasably secured to the probe and initially having a positive buoyancy and having an internal chamber.

## 27,336
## UPHOLSTERY CUSHION CONSTRUCTION COMPRISING A RESILIENT PADDING

Sigmund Bereday, 11 Suchville, Bayamon, Puerto Rico

Original No. 3,266,066, dated Aug. 16, 1966, Ser. No. 427,059, Jan. 21, 1965. Application for reissue June 15, 1970, Ser. No. 46,130
Int. Cl. A47c *27/22, 27/14*; B60n *1/06*
U.S. Cl. 5—361 3 Claims

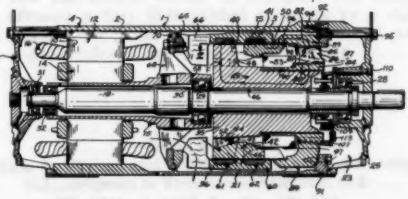


1. An upholstered seating unit *including a frame* for use in furniture and the like comprising a resilient padding, a preformed upholstery cover over said resilient padding, a sheet of slippery material between said padding and cover to reduce friction between it and the cover to a minimum, and *means fastening said upholstery cover with respect to said frame and compressing said resilient padding via said upholstery cover and said sheet of slippery material so that said padding is held in depressed position by said fastening means;* said upholstery cover *at least at the seat portion* being free to move with respect to said slippery sheet due to its smooth surface whereby to facilitate the initial application of the upholstery cover by sliding it over the slippery sheet and padding and preventing wrinkling of the upholstery cover on the seating unit during use *and to enable said depressed padding to rebound to the limit allowed by said fastening means.*

## 27,337
## EDDY CURRENT COUPLING

Ralph L. Jaeschke, Kenosha, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Original No. 3,486,052, dated Dec. 23, 1969, Ser.No. 579,117, Sept. 13, 1966. Application for reissue Aug. 17, 1970, Ser. No. 64,417
Int. Cl. H02k *49/02*
U.S. Cl. 310—105 5 Claims



A single support, stationary field eddy current coupling having two rotors. One of the rotors includes three annular series of poles. Two series of poles are displaced axially from each other and magnetically isolated from the third series of poles. The third series of poles which

is interposted between the said two series is also magnetically isolated from the hub member of the one said rotor. The other rotor includes two cylindrical magnetic inductor members magnetically isolated from each other which surround but are separated from said poles by an air gap whereby the magnetic flux generated by the field member crosses said air gap four times.

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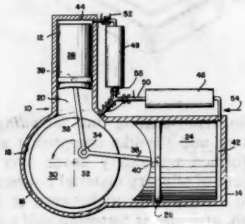
**27,338**
**CRYOGENIC REFRIGERATOR ADAPTED TO MINIATURIZATION**

**Kenneth W. Cowans, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.**

**Original No. 3,423,948, dated Jan. 28, 1969, Ser. No. 627,984, Apr. 3, 1967. Application for reissue May 18, 1970, Ser. No. 48,755**
**Int. Cl. F25b *9/00***
**U.S. Cl. 62—6** **6 Claims**



The structure is a cryogenic refrigerator producing a low-level temperature by closed cycle circulation of a cryogenic fluid. A totally sealed housing is provided which defines a hot cylinder, cold cylinder, and crankcase chamber, the latter having a crankshaft rotatably mounted therein and directly connected to displacers in the cold and hot cylinders. The crankcase chamber which communicates directly with the cold and hot cylinders serves as a reservoir through which the crogenic fluid is cycled during refrigerator operation. The direct rod connections, crankshaft to displacers, eliminate the need for cylinder-defining walls and the related seals and bearing guide arrangements. Motive power is provided by stator windings externally of the sealed housing which operatively cooperate with a rotor journalled internally of the housing and associated with the crankshaft.

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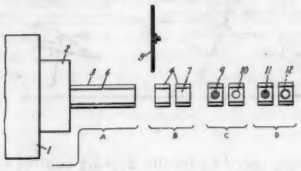
**27,339**
**TURNBUCKLES**

**Russell H. Dornbos, Spring Lake, Mich., assignor to Gerwin Industries, Inc., Michigan City, Ind.**

**Original No. 3,442,000, dated May 6, 1969, Ser. No. 626,843, Mar. 29, 1967. Application for reissue May 25, 1970, Ser. No. 41,123**
**Int. Cl. B23p *13/00***
**U.S. Cl. 29—175** **10 Claims**



Manufacturing steps of extruding tubular metal bar stock of greater width than thickness and having edges of reduced thickness, with an internal bore of rectangular cross section in the thicker portion of the tube; cutting the tube transversely into slugs of lesser width than the thickness of the tube, boring alined holes into the ends of the slugs through narrower ends formed from the reduced edges and into the ends of the oblong opening formed by the extrusion, and tapping the holes with oppositely pitched threads at opposite ends of the slugs.

# PLANT PATENTS

## GRANTED APRIL 11, 1972

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

### 3,102
### ROSE PLANT

David L. Armstrong, Upland, Calif., assignor to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Jan. 22, 1970, Ser. No. 5,163
Int. Cl. A01h 5/00
U.S. Cl. Plt.—25 1 Claim

A bushy rose of the floribunda class, tall-growing, moderately branched and moderately vigorous in habit. The plant has compound leaves comprising from three to seven leaflets which are of medium size, moderately thin, somewhat leathery in texture, and semi-glossy in appearance. These leaflets are oval in form, both the apex and the base being acute. The margin is simply serrate. The color of the open bloom is a distinctive strong reddish orange, tinged with yellow on the underside of the petals. When fully open, the center of the bloom shows brilliant golden yellow around the flower stamens. The petalage is double, ranging from twenty-five to thirty petals, with three to eight petaloids. The flower is high-centered in form at the first, and remains high-centered after opening fully. The bloom has a tea fragrance, from moderate to penetrating in strength. The plant sets hips freely, containing many seeds.

### 3,103
### ROSE PLANT

Mathias Tantau, Uetersen, Germany, assignor to Jackson & Perkins Company, Newport Beach, Calif.

Filed Jan. 22, 1970, Ser. No. 5,164
Claims priority, application Germany, Feb. 18, 1969, 45/69 S
Int. Cl. A01h 5/00
U.S. Cl. Plt.—24 1 Claim

1. A new and distinct variety of rose plant of the fluoribunda class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a bushy, upright, well-branched and compact plant habit, strong dark green foliage of medium size and which is slightly reddish green when young, intensely bright, light golden yellow flower buds of well pointed form, mature, densely filled, fragrant flowers of medium size and abundantly borne in clusters suitable for cut flower production under glass, a distinctive and attractive deep yellow open flower color which is retained without appreciable fading as the flower age, good resistance to blackspot and powdery mildew, and good lasting qualities of the flowers as cut flowers, with a rapid repeating habit of the flowers when grown under glass.

### 3,104
### ROSE PLANT

Alain Meilland, Alpes-Maritimes, France, assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Feb. 5, 1970, Ser. No. 9,086
Claims priority, application France, Feb. 24, 1969, 6904859
Int. Cl. A01h 5/00
U.S. Cl. Plt.—18 1 Claim

A rose plant of the hybrid tea class, discovered as a sport of the rose Carina (U.S. Plant Patent No. 2,378), but of distinct pink color and form, produced on strong growth.

### 3,105
### *HOYA CARNOSA* RUBRA

Barnell L. Cobia, Winter Garden, Fla., assignor to B. L. Cobia, Inc., Winter Garden, Fla.

Filed Feb. 16, 1970, Ser. No. 11,926
Int. Cl. A01h 5/00
U.S. Cl. Plt.—88 1 Claim

A new and distinct plant variety of the milkweed family resembles plants of the *Hoya carnosa* Exotica variety in variegated leaf patterns but is distinguished from the latter variety by certain color characteristics, by slightly larger stems and by a somewhat wider leaf blade that is usually ovate in shape.

### 3,106
### GRAPEVINE

John M. Garabedian, 3158 Hamilton St., Fresno, Calif. 93712

Filed Apr. 29, 1970, Ser. No. 33,111
Int. Cl. A01h 5/03
U.S. Cl. Plt.—47 1 Claim

A large, vigorous, productive grapevine having canes of medium length and thickness, long tendrils of medium thickness, dense foliage, medium size leaves with a 2-series margin, medium size fertile flowers, and fruit of which the clusters are of medium to large size, and the berries white, of large size, firm and crisp of flesh, oval to obovoid in form, seedless, and of superior eating quality; the fruit—which does not shatter even when mature—ripening about a week to ten days earlier than the Thompson Seedless (unpatented), and the berries being of relatively larger size and sweeter, with a bitey taste account high acid, and a slightly muscat flavor.

### 3,107
### EUROPEAN BIRD CHERRY TREE

Edward H. Scanlon, 7621 Lewis Road, Olmsted Falls, Ohio 44138

Filed Nov. 28, 1969, Ser. No. 880,997
Int. Cl. A01h 5/03
U.S. Cl. Plt.—37 1 Claim

A new and distinct variety of European bird cherry tree (*Prunus padus*) distinguished primarily by a shell pink color of the flower and a somewhat iridescent purplish reddish color of the upper side of the leaf.

### 3,108
### ELM TREE

William J. Flemer and William Flemer III, Princeton, N.J., assignors to Treesearch, Kingston, N.J.

Filed Dec. 3, 1969, Ser. No. 881,942
Int. Cl. A01h 5/12
U.S. Cl. Plt.—51 1 Claim

1. A new and distinct variety of elm tree, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a general resemblance to typical American elms, but being

particularly distinguished therefrom by a superior tree form, a superior and more rapid rate of growth, and a superior and outstanding resistance to Dutch elm disease.

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**3,109**
**MAPLE TREE**
**George V. Schichtel, Orchard Park, N.Y., assignor to J. Frank Schmidt & Son Co., Troutdale, Oreg.**
**Filed Dec. 11, 1969, Ser. No. 884,388**
**Int. Cl. A01h** *5/12*

**U.S. Cl. Plt.—51** **1 Claim**

1. A new and distinct variety of maple tree of the type bontanically known as *Acer rubrum*, substantially as herein shown and described, characterized particularly as to novelty by an exceptionally vigorous habit of growth which extends late in the growing season, an upright form terminating in a rounded head at the top of the tree, and having very smooth and shiny bark, and attractive light green foliage of heavy texture and distinctive shape, and which turns red in the fall, while otherwise generally having characteristics usually typical of the species *Acer rubrum*.

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**3,110**
**APPLE TREE**
**William J. Wilson and Emory Clyde Wilson, Fort Valley, Ga., assignors to Bountiful Ridge Nurseries, Inc., Princess Anne, Md.**
**Filed Dec. 11, 1969, Ser. No. 884,389**
**Int. Cl. A01h** *5/03*

**U.S. Cl. Plt.—34** **1 Claim**

1. A new and distinct variety of apple tree, substantially as herein shown an described, characterized particularly as to novelty by a general resemblance of the tree and fruit in most respects to the apple variety commercially known as "Golden Delicious" (unpatented), but being distinguished therefrom by its more attractive smooth-skinned fruit which is almost entirely free of russeting, superior resistance to bitter rot, and an unusual fruiting habit evidenced by a tendency of the fruit to cluster and acquire a cherry red color when very small, but becoming yellowish green in color as the fruit continues to grow to maturity.

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**3,111**
**ROSE PLANT**
**Samuel McGredy IV, Portadown, Ireland, assignor to Armstrong Nurseries, Inc., Ontario, Calif.**
**Filed Dec. 18, 1969, Ser. No. 886,430**
**Int. Cl. A01h** *5/00*

**U.S. Cl. Plt.—22** **1 Claim**

A bush rose plant of the floribunda class adapted for outdoor cultivation, and being of rather stiff upright habit, with erect and almost smooth peduncles. The buds are characterized by gland-tipped cilia on the surface of the bud and by frequent foliaceous parts extending beyond the tip of the bud before the calyx breaks. The flowers are usually borne in irregular clusters on strong medium length stems, being of small to average diameter for its class, from 3" to 3¾", with 25 to 28 petals, and 2 or 3 petaloids. The color is at first relatively pale pink, with strong purplish red overlay at the outer margins of the petals, the inner surfaces being predominantly bright red in color. When fully open, the center of the bloom shows nearly white around the flower stamens.

# PATENTS

PUBLISHED APRIL 11, 1972

## GENERAL AND MECHANICAL

3,654,629

### DISPOSABLE BIB

Marilou Crisman, 1523 East Broadway, Logansport, Ind., and Arthur G. Howard, 5869 N. Keystone, Indianapolis, Ind.

Filed Dec. 29, 1969, Ser. No. 888,681
Int. Cl. A41d *13/04*
U.S. Cl. 2—49 4 Claims

A disposable bib, providing both some liquid-absorbtion and water-proofness, having formed means for snugly pressing the wearer's neck, for more protection.

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3,654,630

### ADJUSTABLE SWIM AND SUN SUIT PANTY GARMENT

Lester W. Block, 8520 Warner Drive, Culver City, Calif.

Filed Sept. 23, 1970, Ser. No. 74,775
Int. Cl. A41d *7/00*
U.S. Cl. 2—67 4 Claims

An adjustable swim and sun suit panty garment having adjusting means for converting the width of the hip bands from the comparatively wide bands of a hip hugger to the comparatively narrower bands of a bikini. The adjusting means is entirely concealed within the hip bands when the garment is worn in a conventional manner. When the garment is converted, only the neatly decorative midportion of the adjusting means is visible from outside the garment. The garment may be converted back and forth as desired.

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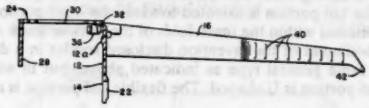
3,654,631

### GLARE SHIELDING DEVICE

Giuseppe Re Baratelli, Deerfield, Ill., assignor to Ramostar Corporation, Deerfield, Ill.

Filed Dec. 2, 1968, Ser. No. 780,326
Int. Cl. A61f *9/02*
U.S. Cl. 2—14 J 8 Claims

Glare shielding device as for night driving motorists in which two shields are supported by a foldable frame so as to be interposed in the wearer's normal line of vision forwardly of his eyes and offset from the pupillary axes thereof to impede light from the oncoming traffic directly striking the




wearer's eyes while permitting him to have substantially full straight ahead and also lateral vision, the frame and shields being a unitary molded piece of translucent plastic material.

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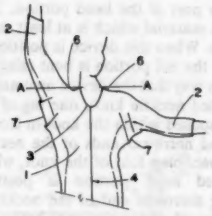
3,654,632

### CLOTHING SLEEVE

Flora L. Lacroix, 6535 St. Andrews Drive, Tucson, Ariz.

Filed June 18, 1970, Ser. No. 47,371
Int. Cl. A41b *1/00*
U.S. Cl. 2—125 7 Claims




The shoulder seam of the sleeve of a garment is formed from material cut upward at an angle of approximately 115° to 145° in relation to a horizontal line from shoulder-tip to shoulder-tip, and includes a front portion comprised of a shorter curved section, a second longer reversed curved section and a straight line section extending to the end of the sleeve, and a back portion comprised of a curved section and a straight line extending to the end of the sleeve, said curved sections having predetermined radii with the three front sections joined together at predetermined angles and the two back sections joined together at predetermined angles.

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3,654,633

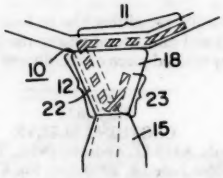
### NECKTIE KNOT-HOLDING DEVICE

Herberts K. Goba, 307 Tegler Building, Edmonton 15, Alberta, Canada

Continuation-in-part of application Ser. No. 37,391, May 11, 1970, now abandoned , Continuation of application Ser. No. 770,948, Oct. 28, 1968, now abandoned. This application May 28, 1970, Ser. No. 41,295
Int. Cl. A43d *25/08*
U.S. Cl. 2—153 25 Claims

According to one aspect of this invention, a device having two portions designated as a head portion and a tail portion is provided for maintaining a knot in a necktie. The tail portion of this device is longer than the head portion and is flexible. The head portion, in this aspect of the invention, may assume various configurations, and may be either rigid or flexible. Said device is insertable in the necktie knot before the

latter is tightened; and when inserted in the knot, the tail portion of the device, which preferably is comprised of a flexible wire, is bent relatively to the head portion so that the device assumes the general outline of a completed necktie knot. When said device is placed within the necktie knot, the head portion is positioned between the downcoming wider end of the tie and the outer circumscribing fold of the knot, and the tail portion is positioned within the knot between the downcoming wider and narrower ends of the tie, and the end of the tail portion is oriented towards the head portion and is positioned within the inner folds of the necktie knot. Another embodiment of the invention disclosed resides in a device of the same general type as indicated above, but in which the head-portion is U-shaped. The flexible tail portion is attached




to the center part of the head portion. The head portion is made from a material which is at least semi-rigid at ambient temperatures. When this device is positioned within the knot of a necktie, the tail portion is bent relative to the head portion in such a way that the device assumes the general outline of a completed necktie knot; one leg of the U-shaped head portion is disposed within the knot in front of the downcoming wider and narrower ends of the necktie but behind the outer circumscribing fold of the knot, while the other leg of the U-shaped head portion is positioned behind the downcoming narrower end of the necktie; and the tail portion is positioned within the knot between the downcoming narrower and wider ends of the necktie, with the end of said tail portion being oriented toward the head portion of the device.

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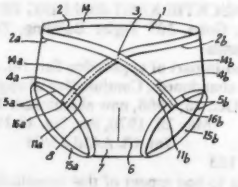
**3,654,634**
**UNDERGARMENT FOR MEN**
**Ruben Javier Torres, 88 Avenue Paul Doumer, Paris, France**
**Continuation of application Ser. No. 811,901, Apr. 1, 1969, now abandoned. This application Nov. 17, 1970, Ser. No. 90,447**
**Claims priority, application France, Apr. 2, 1968, 146782**
**Int. Cl. A41b** *9/02*
**U.S. Cl. 2—224 A** **3 Claims**




Men's briefs assemblable from a one-piece main fabric body portion having terminal wing portions on the main fabric body and a crotch extension and a gusset to be secured to the crotch extension and terminal wing portions to complete the garment.

**3,654,635**
**PIPED OPENING FOR USE IN A GARMENT**
**John L. Cruden, Jr., R.D. #1 Marvin Hollow Road, Walton, N.Y.**
**Original application June 25, 1968, Ser. No. 739,812, now Patent No. 3,587,501, dated June 28, 1971. Divided and this application June 22, 1970, Ser. No. 47,950**
**Int. Cl. A41f** *1/02*
**U.S. Cl. 2—266** **5 Claims**

This disclosure is directed to a piped opening for use in a garment and an apparatus for making the opening. The piped opening comprises corresponding die-cut slits or cuts formed in the front and facing portion of a garment with the flap or flaps defined thereby being reversely folded inwardly of the respective front and facing portions to define a corresponding opening therein. An edging patch having a complementary slit or cut and reversely folded patch flaps is secured to one of the portions with the patch flaps positioned contiguous to corresponding flaps of the adjacent portion to form a partially piped opening. The front and facing portions and then reversely folded to dispose the edging patch therebetween with the respective opening defined in each, disposed in coaxial alignment. The front and facing portions are then secured.

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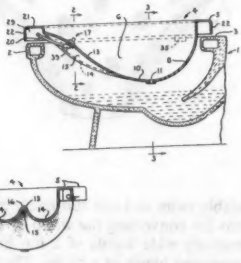
**3,654,636**
**PORTABLE BIDET**
**Erno Restyanszki, 4595 Wilson Street, Gary, Ind.**
**Filed Aug. 5, 1970, Ser. No. 61,256**
**Int. Cl. A41k** *3/22, 11/08*
**U.S. Cl. 4—7** **12 Claims**



The invention is directed to a bidet which may be readily detachably mounted on a conventional toilet bowl for the purpose of promoting the health and sanitation of a human individual.

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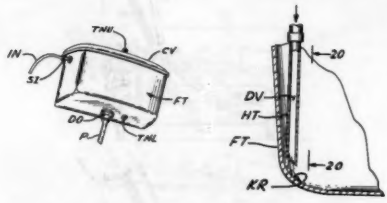
**3,654,637**
**FLUSH TANK APPARATUS**
**Sherwood L. Young, Monson, Mass., assignor to American Standard Inc., New York, N.Y.**
**Original application Aug. 22, 1968, Ser. No. 754,669, now Patent No. 3,533,437. Divided and this application June 1, 1970, Ser. No. 54,065**
**Int. Cl. E03d** *1/01, 1/20*
**U.S. Cl. 4—18** **11 Claims**

Relates to flush tank mechanism for a toilet bowl. The flush tank houses, in addition to a conventional flush valve, a

water inlet valve and an elongated lever having a built-in channel substantially throughout its length for feeding water incoming through said valve to the flush tank. A float is physically coupled to the free end or front end of the elongated lever and the float includes an open-ended chamber for receiving water from the channel of the lever, but the water




is discharged from the chamber through an aperture therein. The channel of the lever provides one path for the incoming water reaching the tank while a hush tube, also coupled to the inlet water valve, provides a second path for incoming water. The lever is coupled to the inlet valve by geared members and they are operated to translate the notary motion of the lever into linear motion to close the inlet valve.

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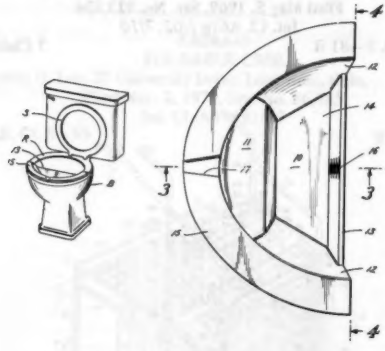
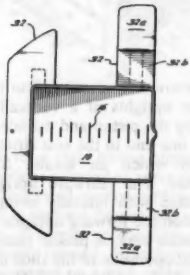
**3,654,638**
**OUTPUT COMMODE PAN**
**Alice W. Nye, 7534 Greendows, Houston, Tex.**
**Continuation-in-part of application Ser. No. 828,307, May 27, 1969, now abandoned. This application Dec. 17, 1969, Ser. No. 885,811**
**Int. Cl. E03d** *13/00*
**U.S. Cl. 4—110** **4 Claims**




A receptacle for collecting and measuring body fluids, particularly urine, adapted to be removably supported in a conventional toilet bowl.

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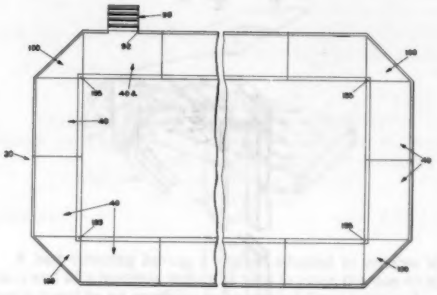
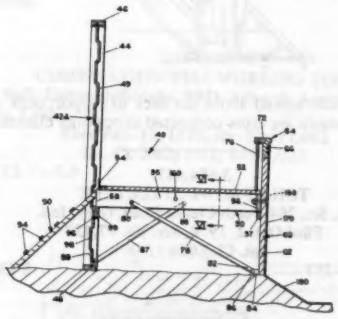
**3,654,639**
**ABOVE GROUND POOL UNITS WITH FOLDABLE SIDE PANEL, DECK AND FENCE**
**Jay A. Lankheet, Holland, Mich., assignor to Glamour Pools Company, Holland, Mich.**
**Filed Sept. 22, 1970, Ser. No. 74,446**
**Int. Cl. E04h** *3/16, 3/18*
**U.S. Cl. 4—172.19** **14 Claims**




Collapsible, foldable unit pool structures, the assembly of which forms an enclosed pool, each unit comprising a portion of a fence and deck hingedly connected together, and in some cases a portion of a pool wall hingedly connected to the deck by a brace. A second brace hinged to the deck is bolted during assembly to the fence. The deck, fence and pool wall sections or portions fold flat for shipping. After each unit is unfolded to its erected state with the deck extending substantially perpendicular to the fence and with all pool wall sections abutted approximately perpendicular and bolted to their respective deck sections, the units are attached end-to-end to each other by bolting the underside of their deck sections together. A pool liner is attached to the pool wall sections over the abutment joints, the liner covering also the ground or any excavation utilized to deepen the pool.

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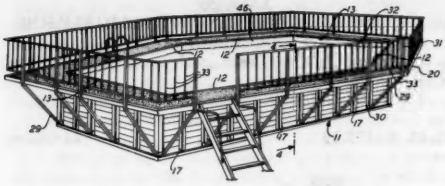
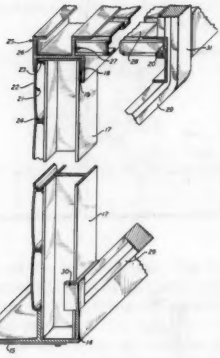
**3,654,640**
**ABOVE GROUND SWIMMING POOL CONSTRUCTION**
**Frederick Katzman, 372 Hamilton Boulevard, Piscataway, N.J.**
**Filed Dec. 24, 1970, Ser. No. 101,299**
**Int. Cl. E04h** *3/16, 3/18*
**U.S. Cl. 4—172.19** **7 Claims**

An above ground swimming pool construction wherein the pool is hexagonal, the vertical walls are supported in chan-

nels and the decks are supported by arms, which are anchored to the channels; and the arms extend upwardly and





outwardly, also extend above the deck to support deck rails, and the channels are cross-connected to opposite channels.

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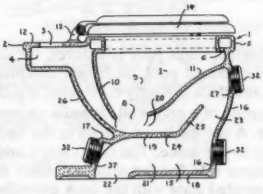
**3,654,641**
**TOILET BOWL STRUCTURE**
**Fred Braun, Sr., 204 North Clarke Road, Gary, Ind.**
**Filed Oct. 2, 1970, Ser. No. 77,429**
**Int. Cl. E03d** *11/00*
**U.S. Cl. 4—257** **8 Claims**



The invention involves providing a lower chamber in a toilet bowl with at least a pair of substantially aligned clean-out openings whereby a cleaning instrument may be extended through either or both of the openings for cleaning the chamber.

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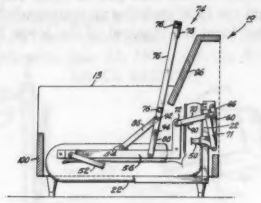
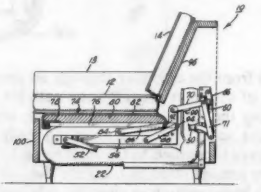
**3,654,642**
**HINGED-SEAT PLATFORM FOR SOFA-BED**
**John J. Barabas, New Rochelle, N.Y., assignor to Castro Convertibles Corporation, New Hyde Park, N.Y.**
**Filed Mar. 10, 1969, Ser. No. 805,774**
**Int. Cl. A47c** *17/14, 17/22*
**U.S. Cl. 5—13** **11 Claims**

The sofa-bed has a hinged, cushioned seat platform which provides a soft support for the seat cushions when the sofa-bed is used as a sofa, and which swings to an upright position to form a headboard for the bed when it is unfolded. The





hinge structure permits the pivot point of the platform to rise and fall when people get up from or sit down on the sofa cushions.

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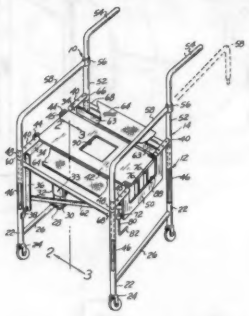
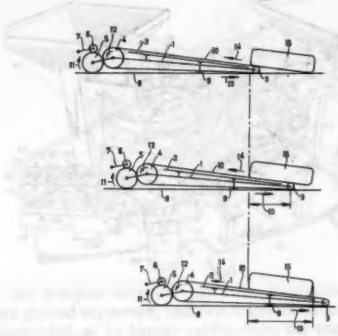
**3,654,643**
**INVALID LIFT-TRANSFER CHAIR**
**Wayne N. Clanan, 1458 Burns Avenue, Detroit, Mich.**
**Filed May 5, 1969, Ser. No. 823,534**
**Int. Cl. A61g** *1/02, 7/10*
**U.S. Cl. 5—81 B** **7 Claims**



A chair base structure on casters has four tubular legs with which telescope the uprights of a vertically movable seat structure actuated by the piston and cylinder of a hydraulic lift jack. Pivoted at one end to the seat structure is a tiltable slide support upon which an invalid transfer slide is reciprocably mounted. The rearward uprights of the seat structure are provided with laterally swinging chair arms which enter sockets on the forward uprights and are pivoted to chair-pushing handle bars. A plastic bearing plate placed on the bed assists the operation of the slide in transferring an invalid between the bed and the chair. The slide support is provided with a central opening which enables its use as an auxiliary toilet seat when moved over a toilet bowl.

3,654,644
**STRETCHER**
Simon Stevens, Emmen, Netherlands, assignor to Stero N.V., Emmen, Netherlands
Filed Oct. 27, 1969, Ser. No. 869,579
Int. Cl. B66f 11/00; A61g 7/10
U.S. Cl. 5—81 4 Claims



A stretcher having an endless belt of flexible material guided by two spaced-apart parallel guides on a frame. A supporting plate is affixed to the frame under the flexible belt. Mounted on the frame is a propulsion mechanism coupled to a driving mechanism for driving the belt in a circumferential direction in such a way that, on moving the frame in the longitudinal direction of the belt with respect to the ground, a corresponding displacement of the belt in the opposite direction is effected.

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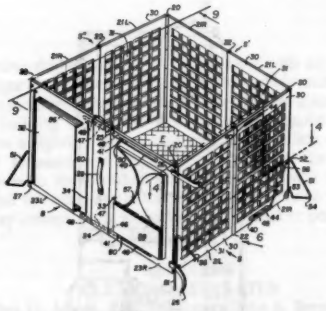
3,654,645
**FOLDABLE CRIB**
Byron D. Lee, 27 University Drive, Longmont, Colo.
Filed Nov. 2, 1970, Ser. No. 86,083
Int. Cl. A47c 31/00
U.S. Cl. 5—99 8 Claims



A foldable crib for a child having hinged wall sections and hinged corner sections adapted to accordian-fold into a compact unit with a backwall section embracing the other wall sections and into a package having the general shape of an ordinary suitcase. A handle at one edge of this folded unit permits it to be easily carried. A cloth-type floor in the crib, with the weave arranged on a bias, stabilizes the same when opened, and when folded, the floor section is merely pulled upwardly between the wall sections. The auxiliary features may be incorporated in this crib, on the opposing sides of the backwall section, such as a mattress and a foldable baby seat, the same enhancing its usefulness and versatility.

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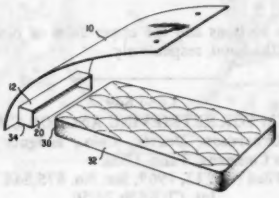
3,654,646
**FITTED BED COVERING**
Stephen J. McMahon, Jr., 1730 Lanier Place, Washington, D.C.
Filed Jan. 30, 1970, Ser. No. 7,006
Int. Cl. A47g 9/02
U.S. Cl. 5—334 C 9 Claims



A bed covering having a pocket adapted to enclose the foot end of a mattress and to be held in place thereon by the pocket and by an overlying conventional fitted bottom sheet. Decorative indicia adjacent the head end of the covering is provided to facilitate the centering of the covering on the mattress.

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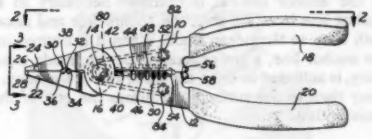
3,654,647
**COMBINATION WIRE WORKING TOOL**
Ted Neff, Hunter Industries, 9851 Adburtis Avenue, La Harbra, Calif.
Filed Feb. 13, 1970, Ser. No. 11,062
Int. Cl. H02g 1/12; B25b 7/22
U.S. Cl. 7—5.3 2 Claims



A hand tool primarily for use with electrical wiring which combines into one tool all the necessary tools normally required when gripping, pulling, bending, cutting, stripping, and crimping operations are performed during an electrical wiring job. The tool includes needle-nose plier jaws for gripping, pulling, and bending wire; a crimping orifice for crimping solderless electrical terminals to the ends of wire; cutter blades for cutting wire; and a plurality of orifices for cutting and stripping insulation material from insulated wire of different diameters.

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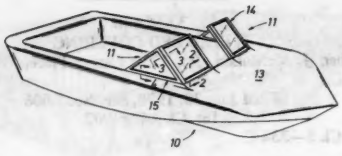
3,654,648
**WINDSHIELD**
Jerry W. Wilhoit, Austin, Tex., assignor to Glastron Boat Company, Austin, Tex.
Filed Aug. 5, 1970, Ser. No. 61,149
Int. Cl. B63b 17/00
U.S. Cl. 9—1 R 13 Claims

A windshield for the hood of a motorboat or the like comprising first and second windshield sections having side edges longitudinally slidably interlocked with one another in a

desired angular relation and anchored to the hood by connectors longitudinally slidably interlocked with the lower



edges of the sections and the upper sides of base members mounted on the hood, respectively.

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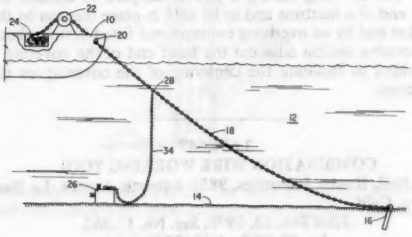
**3,654,649**
**SYSTEM FOR RETRIEVING ANCHOR CHAINS**
**James D. Richardson, Denver, Colo., assignor to Amoco Production Company, Tulsa, Okla.**
**Filed Nov. 12, 1969, Ser. No. 875,844**
**Int. Cl. B63b** *21/50*
**U.S. Cl. 9—9** **3 Claims**



This invention relates to a system for retrieving the anchor chain which has been cut loose from an anchored vessel. A buoy, filled with water to make in non-buoyant, is attached to the anchor line. If it becomes necessary to sever the anchor line from the ship, the anchor line and flooded buoy both drop to the ocean floor. When it is desired to retrieve the anchor line, a gas generating device, made a part of the buoy, is actuated to drive the water out of the buoy. The now buoy rises to the surface and brings the end of the anchor chain with it.

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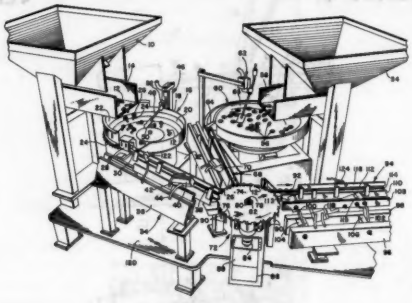
**3,654,650**
**AUTOMATIC ASSEMBLY APPARATUS**
**Warren C. Burgess, Jr., Avon Lake, and Donald N. Buckles, Fairview Park, both of Ohio, assignors to Burgess & Associates, Inc.**
**Filed July 6, 1970, Ser. No. 52,272**
**Int. Cl. B23p** *19/08*
**U.S. Cl. 10—155** **3 Claims**

There is provided an apparatus for the assembly of a male member such as a bolt blank and a female member, such as a washer, which apparatus is characterized by an element for supporting and moving the male member along a predetermined pathway. A guideway for the female member is provided which is coextensive with at least a portion of the pathway and which is adapted to change the relative spacial relationship of the female member to the male member in the predetermined pathway as the female member moves along the guideway. Means are provided for moving the female member along the guideway in synchronized relation with the male member whereby the male and female members are moved relative to one another in the pathway to a final assembled condition. In a specific embodiment, the predetermined pathway is circular, and the guideway for the female member is not only circular to correspond with the predeter-



mined pathway, but also converges toward the supporting the moving means for the male member. In this manner the parts are assembled while in the pathway.

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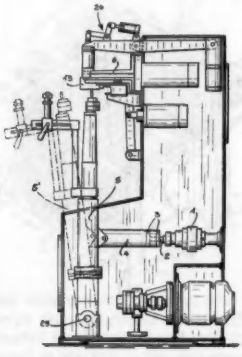
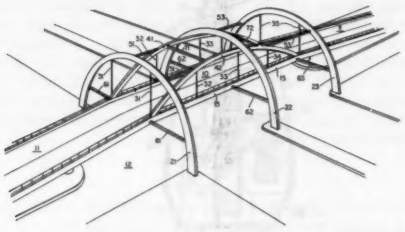
**3,654,651**
**COMBINED HEEL, FOREPART AND CEMENT-LASTING MACHINE**
**Herbert Schindler, Pirmasens, and Gerhard Winter, Havenstein, both of Germany, assignors to Firma Schon & Cie. Gesellschaft mit beschrankter Haftung, Pirmasens, Germany**
**Filed July 30, 1970, Ser. No. 59,633**
**Claims priority, application Germany, Aug. 5, 1969, P 19 39 747.8**
**Int. Cl. A43d** *21/00, 3/00*
**U.S. Cl. 12—12.5** **10 Claims**



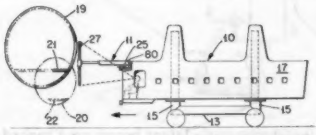
A combined heel, forepart and cement-lasting machine having a heel-band supported in the machine frame and a last-carrier displaceable by means of a motor in a direction towards the heel-band. The motor is a rotary motor which engages the last-carrier by way of a self-locking spindle drive to provide a precise position thereof during the working cycle.

3,654,652
**SUSPENDED OVERPASS**
William W. Pleasants, P.O. Box 82, Bethel, Del.
Filed Jan. 4, 1971, Ser. No. 103,748
Int. Cl. E01d *1/00*
U.S. Cl. 14—1 3 Claims



An overpass structure has three transverse arches which are ground supported, and two longitudinal arches which are suspended, as by hanger cables, from the transverse arches. The roadway is suspended from the transverse and longitudinal arches, in alignment with and between the longitudinal arches. Horizontal struts provide horizontal support.

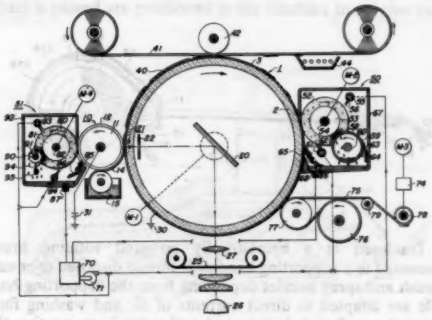
3,654,653
**PROBE APPARATUS**
Walter S. Eggert, Jr., Huntingdon Valley, and Christian E. Franz, Roslyn, both of Pa., assignors to Boothe Airside Systems, Inc.
Filed Mar. 2, 1970, Ser. No. 16,174
Int. Cl. E01d *15/12*
U.S. Cl. 14—72 7 Claims



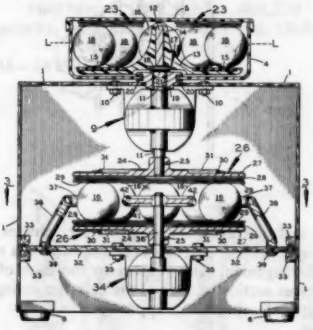
Sighting probe apparatus for a vehicle with an elevatable passenger compartment having an extensible and rotatable gangway-canopy structure for mating with an aircraft or terminal building to transfer passengers. The probe apparatus includes a sighting bar carried by a boom which can be extended to assume a vertical position when the gangway-canopy is in its retracted position. Novel track means are provided to rotate and retract the sighting bar to permit the gangway-canopy to be extended to an operative position.

3,654,654
**CLEANING APPARATUS**
Christian O. Abreu, East Rochester; John S. Bernhard, Pittsford, and Henry T. Chiavaroli, Henriette, all of N.Y., assignors to Xerox Corporation, Rochester, N.Y.
Filed Nov. 14, 1969, Ser. No. 876,817
Int. Cl. B08b *1/02*; A47l *13/40*
U.S. Cl. 15—1.5 17 Claims

A cleaning mechanism for cleaning surfaces of contaminants. The apparatus has a sponge-like member that rotates in contact with the surface to be cleaned. A liquid is sprayed into the sponge-like member to help remove contaminants from the surface to be cleaned. The sponge-like member is squeezed by a hard roller to remove excess liquid and contaminants so that it may be recycled to continually clean the surface. The unit is housed in a mechanism that has provisions for draining the liquid without wetting other portions of the machine in which the mechanism is housed. A further option incorporates a wiper web and wiper blade surface contacting means operating in conjunction with the sponge-like member.



3,654,655
**MACHINE FOR CLEANING AND POLISHING POOL BALLS**
Jack J. Mitnick, 705 East 10th Avenue, Hialeah, Fla.
Filed Nov. 2, 1970, Ser. No. 85,912
Int. Cl. A63b *47/04*
U.S. Cl. 15—21 A 6 Claims



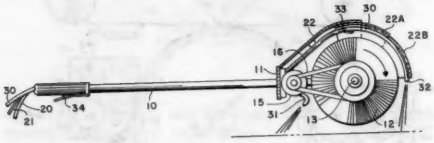
A motor driven machine for washing and polishing pool balls on which is provided a container for rotation of the balls therein against brushes in the presence of a cleaning liquid and then the transfer of the washed and dried balls in contact between deep pile covered surfaces of a pair of power rotated coaxial discs rotated at different speeds including means for confining the balls between the fleece or the pile and including bumper means for the random rotation of the balls while being moved in a generally circular path between the discs for polishing.

**3,654,656**

## SELF-SUPPORTING ROTARY BRUSH

**Ernest L. Romagosa, 11353 Fernald, Dallas, Tex.**

**Filed Aug. 29, 1969, Ser. No. 854,165**
**Int. Cl. A46b** *13/04*
**U.S. Cl. 15—24** **4 Claims**




Disclosed is a hydraulically powered rotating brush mounted in a supporting handle. A shroud disposed over said brush and spray nozzles depending from the supporting handle are adapted to direct currents of air and washing fluid onto the surface being washed and assist in supporting the weight of the device during operation.

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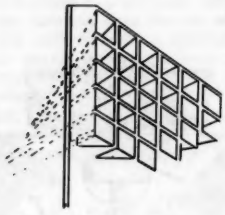
**3,654,657**

## FOOT MAT FOR VEHICLES

**Otto Hubel, Hamburg, Germany, assignor to Dupol-Rubbermaid GmbH Fabrik fur Gummi-und Kunststofferzeugnisse, Dreieichenhain, An der Trift, Germany**

**Filed Aug. 3, 1970, Ser. No. 60,364**
**Claims priority, application Germany, Aug. 5, 1969, P 19 39 716.1**
**Int. Cl. B62d** *25/20*
**U.S. Cl. 15—215** **6 Claims**



A foot mat of elastomeric material for vehicles, said mat having honeycomb or alveolar cells disposed in a slanting or inclined arrangement with respect to the base of the mat, with the cross section of each of the cells increasing from the bottom upwardly towards its upper open end.

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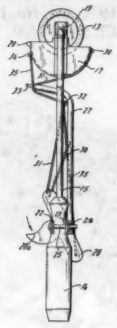
**3,654,658**

## SPLATTER SHIELD AND BUMPER FOR PAINT ROLLER

**Imre Kovacs, Star Route, Massena, N.Y.**

**Filed Dec. 3, 1970, Ser. No. 94,737**
**Int. Cl. B44d** *3/28*
**U.S. Cl. 15—248 A** **7 Claims**

A device adapted to be affixed without tools to a conventional paint roller to serve as a splatter shield and to act as a bumper preventing the movement of the paint cylinder against an adjacent wall. The shield of the device is mounted on the spindle of the roller and is rotatable around the paint cylinder. The clamp of the device has a plate rotatable by a finger of the hand holding the handle of the roller. The plate and the shield are interconnected by a pair of guide lines so that the shield can be positioned as desired by finger rotation of the plate.



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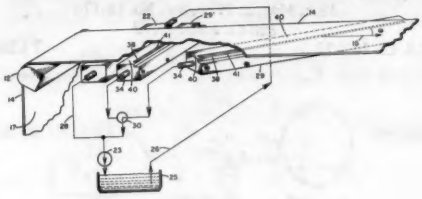
**3,654,659**

## LIQUID TONER CLEAN-OFF SYSTEM FOR HIGH SPEED OPERATION

**John Blumenthal, Wickliffe, Ohio, assignor to Clevite Corporation**

**Filed May 6, 1970, Ser. No. 35,092**
**Int. Cl. A47l** *5/38*
**U.S. Cl. 15—306 A** **5 Claims**



When an electrostatic latent image on a record medium is developed using liquid toner, excess toner is left on the record. The excess toner is removed by passing the record over a toner clean-off head having an elongated opening extending across the record and maintained at reduced pressure. The maximum record velocity, at which satisfactory toner removal is obtained, is increased by proportioning the trailing land adjacent to the opening to promote high velocity air leakage between the land and the record into the opening. A further, substantial increase is obtained by orienting the clean-off opening so that the length thereof forms an oblique angle with the direction of record motion. Preferably, the angle is less than 30°. The clean-off opening may be broken into a plurality of shorter, intersecting openings arranged in a zig-zag pattern across the record, thereby reducing the space occupied along the length of the record.

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**3,654,660**

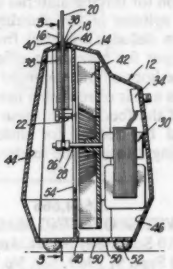
## PHONOGRAPH RECORD VACUUM CLEANER

**William W. Taylor, 16472 Malden Circle, and Richard O. Spencer, 3952 Sirius Drive, both of Huntington Beach, Calif.**

**Filed Apr. 16, 1970, Ser. No. 29,048**
**Int. Cl. A47l** *5/22*
**U.S. Cl. 15—308** **3 Claims**

A housing provided therein with a vertically oriented slot of a size to receive a lower portion of a record on edge,

means in the housing and engageable with the edge of a record in the slot for supporting the record for rotation about its axis, brushes carried by the housing and respectively extending along opposite edges of the slot and engageable with successive portions of opposite sides of a record in the slot as



the record is rotated about its axis, vacuum means in the housing for flowing air into the housing through the slot to remove dust from opposite sides of the record and from the brushes, the air being exhausted through an outlet in the housing, and means in the housing for rotating the record about its axis as air flows into the housing through the slot.

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**3,654,661**

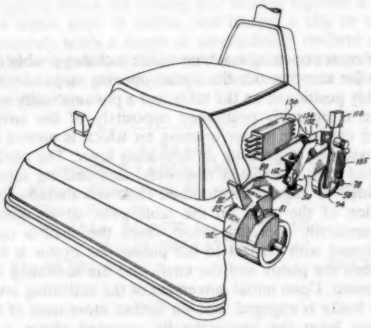
**VACUUM CLEANER**

**Ernest R. Scott, Mayfield Heights, Ohio, assignor to General Electric Company**

**Filed Nov. 26, 1969, Ser. No. 880,305**

**Int. Cl. A47l** *5/34*

**U.S. Cl. 15—333** **7 Claims**



An electric vacuum cleaner construction wherein a cam and lever arrangement is provided for readily adjusting the nozzle of a vacuum cleaner for cleaning carpets of various pile heights. The vacuum cleaner may also be quickly converted to operate off-the-floor vacuum tools.

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**3,654,662**

**RUG CLEANING MACHINE**

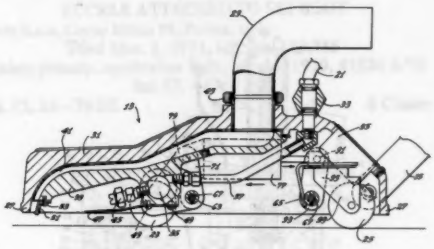
**Leonard E. Bates, Torrance, Calif., assignor to Cardic Machine Products, Inc., Inglewood, Calif.**

**Filed June 15, 1970, Ser. No. 46,069**

**Int. Cl. A47l** *11/34*

**U.S. Cl. 15—302** **12 Claims**

A machine for cleaning rugs having one or more nozzles through which a high pressure fluid is injected into the pile of the rug to cause a cleaning reaction with the dirt therein. A vacuum, drawn through the machine, removes the dirt and fluid from the rug. The machine is provided with a plurality of wheels which extend below the lower skirt surface of the machine when it is not being used for cleaning so as to facilitate movement of the machine across a rug or other surface. The nozzle or nozzles through which the high pressure fluid is passed are positioned in the machine to receive such



fluid from a plenum chamber. A piston-cylinder is positioned between rods upon which links carrying the machine wheels are mounted so as to simultaneously rotate the rods about their axes to raise the wheels. The cylinder is suitably connected to the plenum chamber so that when fluid enters the chamber, the piston and cylinder automatically react to withdraw the wheels into the machine so that the skirt rests directly upon the carpet, allowing more efficient utilization of the vacuum system.

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**3,654,663**

**DEVICE FOR CLOSURE OF BOXES, PREFERENTIALLY BOXES FOR ENCLOSURE OF ELECTRICAL EQUIPMENT**

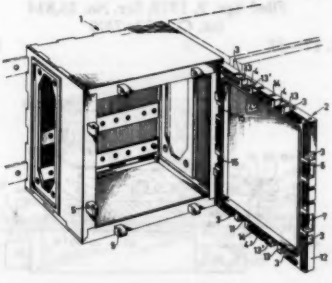
**Sven Erik Algotsson, Gavle, Sweden, assignor to AB Elektroverken i Gavle, Akargatan, Gavle, Sweden**

**Filed Mar. 4, 1969, Ser. No. 804,229**

**Claims priority, application Sweden, Mar. 6, 1968, 2953/68**

**Int. Cl. E05d** *15/50*

**U.S. Cl. 16—147** **6 Claims**

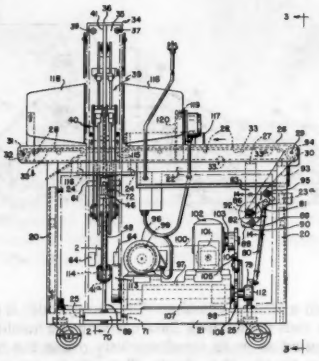


A box cover is provided in all its side edges with cut-outs, some of which correspond to lugs on the front of the box remote from its bottom in which lugs can be inserted pins sliding across the cut-outs corresponding to the lugs, so forming hinges and/or locking devices.

## 3,654,664
## MEAT TENDERIZER

**Fred Fetzer, Strongsville, and Ronald P. Miranda, Sandusky, both of Ohio, assignors to Bettcher Industries, Inc., Birmingham, Ohio**

**Filed Mar. 9, 1970, Ser. No. 17,668**
**Int. Cl. A22c** *9/00*
**U.S. Cl. 17—25** **8 Claims**

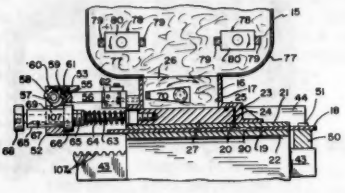


As a meat product travels intermittently along a horizontal conveyor belt by fixed increments, a plurality of downwardly directed blades carried by a vertically reciprocating ram carriage are moved from a position above the meat downwardly through the meat and then withdrawn upwardly. A stripper carriage associated with the ram carriage follows the latter during its downward stroke leaving a stripper frame resting on top of the meat. The stripper frame is locked in that position until the blades move upwardly out of the meat, at which time the stripper frame is unlocked and moved upwardly propelled by the ram carriage. Timing means causes said conveyor belt to move only when said blades are clear of said meat. Means is provided for varying the increment of conveyor belt travel while the machine is running.

## 3,654,665
## MOLDING DEVICE FOR PLASTIC MATERIAL

**James A. Holly, Richton Park, Ill., assignor to Hollymatic Corporation**

**Filed Apr. 9, 1970, Ser. No. 26,814**
**Int. Cl. A22c** *7/00*
**U.S. Cl. 17—32** **11 Claims**

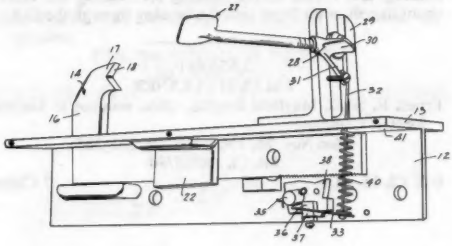


A molding apparatus for forming articles and specifically patties from a moldable material and specifically ground meat, fish or the like in which a plurality of articles are formed simultaneously by providing a movable mold having a plurality of mold openings therein, a hopper for retaining a supply of the moldable material and a plurality of feeders in the bottom section of the hopper movable toward and away from a fractional number of the passages leading to the mold openings when the mold is in material receiving position and with force means for moving the feeders toward and away from the passage means for filling the mold openings. The invention also includes a partition dividing the bottom section of the hopper into a plurality of separate parts, a feeder in the bottom section for forcing material therefrom into a mold opening and an agitator in the plurality of separate bottom parts movable to dislodge material from the adjacent portions of the hopper for increasing efficiency in feeding the material from the hopper into the mold openings. The invention also includes a pair of rotatable movers in the hopper on opposite sides of the feeder with these mover devices being rotatable toward the feeder for dislodging the moldable material and urging it toward the feeder.

## 3,654,666
## OYSTER OPENING MACHINE

**Leo H. Lanier, 710 South Bay Street, Amite, La.**

**Filed Sept. 9, 1969, Ser. No. 856,453**
**Int. Cl. A22c** *29/00*
**U.S. Cl. 17—76** **2 Claims**



An oyster opening machine which includes a table or platform for carrying out the oyster opening steps. An anvil is slidably positioned on the table and a pneumatically movable piston is operably positioned oppositely of the anvil. The piston carries an oyster opening bit which is moved toward the oyster by depressing an activating lever. The anvil has a toothed rack associated therewith, and braking means are provided to engage the toothed rack and thereby lock the position of the anvil on the table prior to energizing the pneumatically operated piston. Once the anvil is correctly positioned with respect to the piston, the oyster is inserted between the piston and the anvil, and the activating lever is depressed. Upon initial movement of the activating lever, the anvil brake is engaged, and on further movement of the activating lever the pneumatically operated piston is urged toward the oyster to perform the opening function.

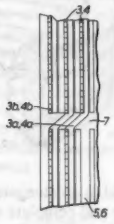
## 3,654,667
## CARDING MACHINES

**Wei Tsing Ling, 9 Grampion Road, 4th floor, Kowloon, Hong Kong**

**Filed Jan. 21, 1970, Ser. No. 4,567**
**Claims priority, application Great Britain, Jan. 21, 1969, 3,402/69**
**Int. Cl. D01g** *15/12*
**U.S. Cl. 19—112** **4 Claims**

A carding machine comprising a card cylinder and a doffer each peripherally wound with toothed wire arranged as a series of parallel closed-spaced, preferably circular, rings, the rings of toothed wire on the doffer being offset in axial direction with respect to the rings of toothed wire on the

card cylinder and the teeth of the rings of toothed wire on the doffer intruding into the spaces between the rings of




toothed wire on the card cylinder to remove fibers which might otherwise collect in said spaces.

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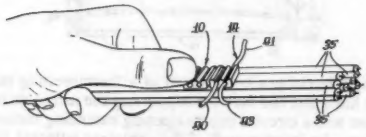
**3,654,668**
**WRAPPING DEVICE**
**Arthur I. Appleton, 1701 W. Wellington c/o Appleton Electric Co., Northbrook, Ill.**
**Filed May 15, 1970, Ser. No. 37,627**
**Int. Cl. A44b** *21/00*
**U.S. Cl. 24—16 R** **7 Claims**




A wrapping device for binding and holding together a plurality of items, such as cables, and feature a clip or cleat which securely holds a length of longitudinally resilient cord or the like wrapped in tension about said items. In one form, a plurality of cleats are integrally molded together in series to facilitate their use.

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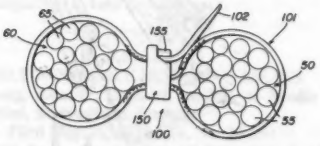
**3,654,669**
**DOUBLE-LATCH CABLE TIE**
**Ronald T. Fulton, Tinley Park, Ill., assignor to Panduit Corporation, Tinley Park, Ill.**
**Filed Mar. 31, 1970, Ser. No. 24,295**
**Int. Cl. B65d** *63/00*
**U.S. Cl. 24—16 PB** **16 Claims**




A cable tie comprises a flexible strap having a row of teeth on one longitudinal surface thereof and a toothed wedge-shaped head at one end thereof, and a locking frame having a first and second strap-accommodating openings therethrough and being trapped on the strap with the strap in the first opening, the first opening being shaped to simultaneously accommodate the head and the other end of the strap therein with the row of teeth engaging the head to latch the strap in a first loop around a first bundle, the second opening having a detent and a strap-bearing surface therein biased toward each other, the detent engaging the row of teeth when the other end of the strap is received through the second opening for latching the strap in a second loop around a second bundle; several alternative embodiments of detents and strap-bearing surfaces, and a strap having two rows of teeth are also disclosed.

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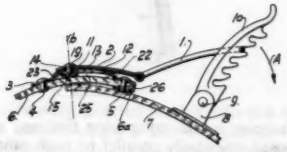
**3,654,670**
**BUCKLE ATTACHED TO SKI BOOT**
**Loris Baso, Corso Milan 19, Padua, Italy**
**Filed Mar. 1, 1971, Ser. No. 119,755**
**Claims priority, application Italy, Mar. 3, 1970, 41530 A/70**
**Int. Cl. A43c** *11/00*
**U.S. Cl. 24—70 SK** **8 Claims**




A buckle on ski shoes consisting of a toothed tensioning lever pivotally arranged on the one instep portion and a longitudinally adjustable clamping loop which is secured to the other instep portion by means of a mounting plate and an adjustable plate which can be connected to the tensioning lever.

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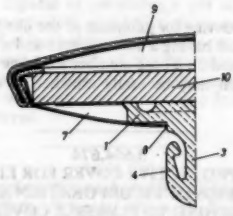
**3,654,671**
**BUTTON, IN PARTICULAR A CUSHION PADDING-BUTTON**
**Rudolf Berning, Schwelm/Westphalia, Germany, assignor to Firma Astor-Werk Otto Berning & Co., Schwelm/Westphalia, Germany**
**Filed Dec. 28, 1970, Ser. No. 101,530**
**Claims priority, application Germany, July 10, 1970, G 70 26 061.6**
**Int. Cl. A44b** *1/18*
**U.S. Cl. 24—102 T** **3 Claims**




A button, in particular a cushion padding-button, which comprises an anchor-shaped securing part for a connecting means leading to an oppositely disposed button. The securing part includes anchor wings having free ends and an anchor shaft, as well as nose members pointing towards the anchor shaft. The nose members form undercut steps of thread insertion slots.

**3,654,672**
**WEDGE CLAMPING DEVICE FOR CABLE**
**Ivan R. Bullar, 110 Cumberland, Maryland Heights, Md.**
**Filed Feb. 17, 1969, Ser. No. 799,757**
**Int. Cl. F16g *11/04***
**U.S. Cl. 24—136 K** **2 Claims**

Cable clamping means comprising first and second face plates disposed essentially parallel to each other and provided with apertures therein, elongated spacers operably mounted between said face plates providing a wedge shaped space therebetween, a clamping block operably disposed within said wedge shaped space, and a hollow cylindrical eyelet operably disposed through said apertures in said face plates and clamping block.

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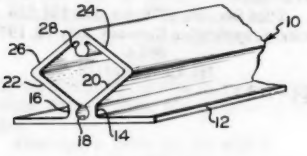
**3,654,673**
**FASTENING DEVICE FOR GARMENTS**
**Bruce K. Thaeler, Meadville, Pa., assignor to Textron Inc.**
**Filed Jan. 12, 1970, Ser. No. 2,217**
**Int. Cl. A44b *17/00***
**U.S. Cl. 24—208 A** **6 Claims**



A fastening device for garments or the like in the form of a plastic extrusion having a stud element and a socket element integrally formed on a base member to define a single unitary component that may be easily attached to a fabric, paper, etc.

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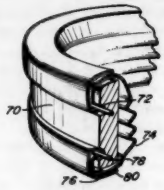
**3,654,674**
**FLEXIBLE PROTECTIVE COVER FOR ELASTIC BAND AND METHODS OF INCORPORATION AS A PART OF OR ATTACHING TO FLEXIBLE COVERS, TUBES, PROTECTIVE WEAR, ETC.**
**Willard Abner, P.O. Box 100, Woodland Hills, Calif.**
**Filed July 28, 1970, Ser. No. 58,755**
**Int. Cl. A44b *21/00***
**U.S. Cl. 24—243 K** **19 Claims**

A flexible protective cover employing an elongated rubber band in a protective sleeve employed as a part of or attached to various types of flexible covers, protective wear such as shower caps, gloves, rain wear, boots, tubular members and the like. The method and procedure for assembling the rubber band with the sleeve and the apparatus for accomplishing the assembly so that the elastic material will be



covered while is is held in an elongated position so that it will have the retractability and complete working ability of a non-protected rubber band.

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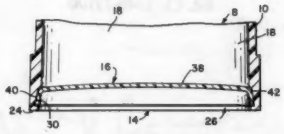
**3,654,675**
**BURIAL URN**
**Fred D. Peterson, Belmont, Calif., assignor to Peterson Products of San Mateo, Inc., Belmont, Calif.**
**Filed June 15, 1970, Ser. No. 46,351**
**Int. Cl. A61g *17/08***
**U.S. Cl. 27—1** **1 Claim**



A rigid burial urn constructed of a thermosetting material which has a flat end face for supporting the urn in an upright position and a circular access opening extending through the end face. An interior wall of the container adjacent the end face includes a groove into which a resilient cover constructed of a thermoplastic material and having a frustoconical skirt is snapped to seal the interior of the container.

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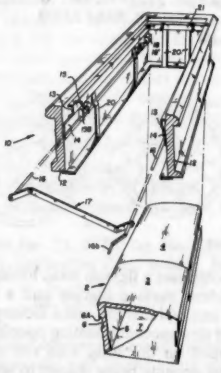
**3,654,676**
**CASKET CAPSULE**
**Wilfred Lewis McHugh, 2501 Carleton Street, Calgary, Alberta, Canada**
**Filed Mar. 11, 1970, Ser. No. 18,645**
**Claims priority, application Canada, Mar. 12, 1969, 045,442**
**Int. Cl. A61g *17/00***
**U.S. Cl. 27—2** **7 Claims**



Apparatus is described for use with burial coffins having a re-useable outer casket and an inner casket capsule. Mount-

ing means are attached to the interior of the outer casket, and support means are carried by the mounting means and are adapted to engage a shoulder provided on the exterior of the casket capsule. In this way, the casket capsule is both supported and held in substantially fixed relation to the outer casket. Actuating means are provided on the outer casket for activating the support means enabling the casket capsule to be received and releaseably retained within the outer casket. Preferably, guide means are provided on the interior of the outer casket for properly orienting the casket capsule enabling it to be closely received within the outer casket. A tensioner device is also provided to generate a biasing force to disable any unintentional movement of the casket capsule relative to the outer casket.

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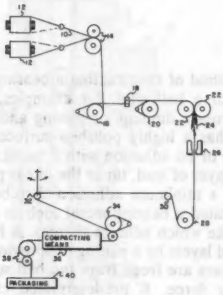
**3,654,677**

## APPARATUS FOR BULKING YARN

**Jack C. Binford; Fredrick A. Ethridge, and James R. Talbot, all of Charlotte, N.C., assignors to Fiber Industries, Inc.**

**Filed Aug. 8, 1969, Ser. No. 848,549**
**Int. Cl. D02q** *1/20*
**U.S. Cl. 28—1.3** **11 Claims**




A method for producing a yarn having latent bulking characteristics and the apparatus therefor is described. The yarn is composed of multifilament synthetic fibers which have been crimped and subjected to a constant tensioning process. The process involves subjecting a drawn yarn, preferably freshly drawn, to a crimping process which can be any of a number of crimping methods including stuffer box crimping, gear crimping, steam jet crimping and the like. The yarn is withdrawn from the crimping step under a low, substantially uniform tension, tensioning the yarn under a higher constant tension to at least partially extend the crimps, entangling or twisting the yarn and taking the yarn up on a package. The bulk characteristics of the yarn are preferably developed after incorporation into the end product such as a carpet by subjecting to heat and moisture.

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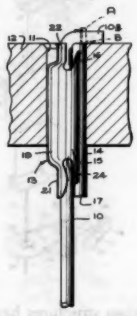
**3,654,678**

## FELTING NEEDLE MOUNTING MEANS

**George Young, Alcester, England, assignor to Needle Industries Limited, Birmingham, England**

**Filed May 26, 1970, Ser. No. 40,594**
**Claims priority, application Great Britain, June 7, 1969, 28,904/69**
**Int. Cl. D04h** *18/00*
**U.S. Cl. 28—4 R** **10 Claims**

A needle mounting member for mounting a barbed felting needle in a hole in a needle carrier of a felting machine, the hole being of greater cross-sectional dimensions than the needle to be mounted therein. The needle mounting member is formed from resilient metal strip shaped to afford firstly means for gripping the needle and secondly means for gripping the hole internally. This means for gripping the needle comprises a shaped seating including two axially spaced seating parts formed at opposite ends of a rigid part, and a resiliently displaceable tongue which is disposed axially between the seating parts. The outer gripping means comprises an outwardly directed seating afforded by said rigid part and a further tongue which is resiliently displaceable relative thereto and is adapted to press outwardly against the side wall of the hole. The two resiliently displaceable tongues are effectively isolated from one another by the common rigid part and thus act independently.



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**3,654,679**

## MICROVOIDING WITH ALKALI METAL HYDROXIDE A HEAT FUSED FABRIC OF POLYAMIDE WITH FIBER OCCLUDED AXIALLY ALIGNED POLYESTER MICROFIBERS

**Carlo Meneghini, Chester; Richard Eugene Mayer, Richmond; Stanley David Lazarus, Petersburg, and Norman Barry Rainer, Richmond, all of Va., assignors to Allied Chemical Corporation, New York, N.Y.**

**Filed July 30, 1968, Ser. No. 748,615**
**Int. Cl. D02g** *3/36*
**U.S. Cl. 28—73** **2 Claims**

A fibrous material, which can be a filament, fabric, or a film, having increased whiteness and a desirable luster is produced by a process which comprises treating the fibrous material comprising a polyamide matrix having polyester microfibers dispersed therein with a hot, aqueous caustic solution containing about 0.5 to 10, preferably about 2 to 6, weight percent of a caustic material which can be an alkali metal oxide or hydroxide or an alkali metal salt of a weak acid which is capable of producing a pH of at least about 12.5 at a concentration of 0.1N in aqueous solution, at a temperature of at least about 95° C, for a period of time sufficient to remove a portion of the polyester microfibers to produce elongated microvoids in the fibrous material thereby increasing the whiteness and imparting a lustrous effect to the fibrous material.

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**3,654,680**

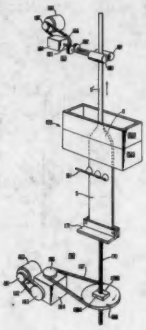
## METHOD OF MAKING GAS DISCHARGE DEVICE

**Wolfgang W. Bode, Sylvania; Glenn H. Dunlap, Maumee; Anthony M. Kobylak, Rossford; Raymond S. Richards, and Lawrence V. Pfaender, both of Toledo, all of Ohio, assignors to Owens-Illinois, Inc.**

**Original application Apr. 28, 1969, Ser. No. 819,641, now Patent No. 3,602,754. Divided and this application Nov. 2, 1970, Ser. No. 85,892**
**Int. Cl. H01j** *9/18, 9/36*
**U.S. Cl. 29—25.16** **10 Claims**

Methods of making complex glass panel structures having precision dimensions. Glass tubes, rods, plates or other large

glass structures are redrawn individually or in groups to filamentary or capillary size tube or gas continuums which are assembled as a monolayer to form a gas discharge panel, for



example. Complex glass structures having precision uniform cross-sectional dimensions are constructed. Various novel glass structures and/or conductor configurations and methods of assembling are disclosed.

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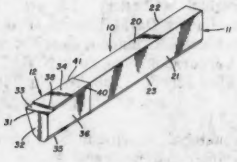
**3,654,681**

**CUTOFF TOOL HAVING IMPROVED CHIP RELIEVING SURFACE**

**William B. Stein, Barberton, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio**

**Filed Apr. 22, 1970, Ser. No. 30,683**
**Int. Cl. B26d** *1/00*
**U.S. Cl. 29—95** **5 Claims**



A metal cutoff tool characterized by the fact that the cutting portion thereof is provided with a chip breaker surface that includes opposed chamfered surfaces located rearwardly of the cutting edge and that assist in providing clearance for chip removal purposes.

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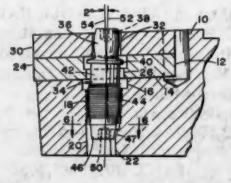
**3,654,682**

**TOOL HOLDER**

**Edward H. Newbould, 191 Silver Spur Drive, York, Pa.**

**Filed Sept. 1, 1970, Ser. No. 68,609**
**Int. Cl. B26d** *1/00*
**U.S. Cl. 29—96** **5 Claims**



A tool holder having a shank provided with a recess to support an anvil and an expendable cutter insert which is held against one or more walls of the recess by a clamping screw provided with a lever action effected by the screw as it is threaded into a socket in the shank of the tool.

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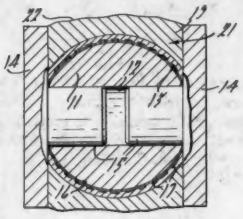
**3,654,683**

**METHOD OF CONSTRUCTING A BALL TYPE BEARING**

**Charles S. White, Route 3, P.O. Box 454-H, Palmdale, Calif.**

**Filed Sept. 28, 1970, Ser. No. 76,109**
**Int. Cl. B23p** *11/00, 17/00;* **F16c** *9/06*
**U.S. Cl. 29—149.5 B** **6 Claims**



The method of constructing a bearing such as a ball for a rod end or a ball stud, for examples, has layers built up thereon from a dipping, or plating and/or spraying process. The ball has a highly polished surface which is treated to have little or no adhesion with a metal layer plated thereon. The first layer of lead, tin or the like is plated on the ball surface with a minimum adhesion therebetween. On this first layer is plated a bearing metal such as silver, nickel, bronze and the like which adheres thereto. A housing is built up on the second layers by a plating or spraying process and the adherred layers are freed from the ball surface by a very light breakaway force. A predetermined clearance is obtained between the bearing metal and ball surface when the first layer is eroded away.

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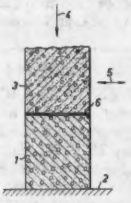
**3,654,684**

**METHOD OF MAKING A BEARING FOR STRUCTURAL ELEMENTS**

**Hans Alfred Nell, Klippe 17, Langenberg, Germany**

**Filed Mar. 3, 1970, Ser. No. 16,005**
**Claims priority, application Germany, Mar. 3, 1969, P 19 10 727.8**
**Int. Cl. B23p** *11/00;* **B21d** *53/10;* **B23q** *17/00*
**U.S. Cl. 29—149.5 NM** **8 Claims**



A bearing for structural elements is made by first providing at least two foil components each of which has a free surface which in use of the bearing is to slidingly engage the free surface of the respective other component. Thereupon the free

surfaces are placed into face-to-face abutment and the two components are subjected to such forces and movements as at least approximate those which the finished bearing is expected to encounter in actual use, for instance by advancing the foil components between two pressure rollers rotating in mutually opposite directions. In so doing the bearing has imparted thereto a predetermined at least substantially constant coefficient of friction before it is subjected to actual use, and which coefficient of friction it could otherwise only attain over a period of time in actual use. actual use.

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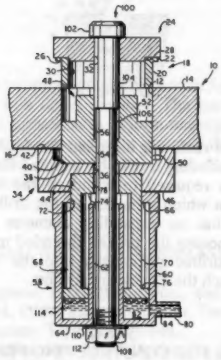
**3,654,685**

## APPARATUS FOR INSTALLING BUSHINGS

**Robert H. Shiflet, Chula Vista, Calif., assignor to Rohr Corporation, Chula Vista, Calif.**

**Filed Mar. 16, 1970, Ser. No. 20,310**
**Int. Cl. B23p** *19/00, 19/04;* **B23q** *17/00*
**U.S. Cl. 29—200 R** **9 Claims**



Apparatus for seating a bushing includes a member which centers a bar coaxially in an aperture in a part and a disk the edge of which is recessed on one side thereof so as to engage one end and the adjacent portion of the inner wall of the bushing, the edge of the other end of said bushing being initially engaged with the edge of the aperture on one side of the part. A second centrally apertured disk abuts the other side of the part, and the bar extends through the aperture in this disk and through apertures in a ram and pressure cylinder assembly. The free end of the ram engages the second disk and the bar is locked to the pressure cylinder so that when pressure inside the latter is increased, both the bar and cylinder move away from the second disk and the bushing is thereby pulled into the aperture in the part.

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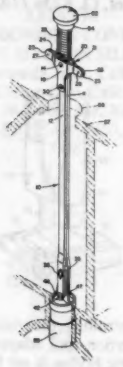
**3,654,686**

## CLAMPING TOOL

**Frederick R. McFarland, and Walter L. Diffenderfer, both of Lancaster, Pa., assignors to K-D Manufacturing Company, Lancaster, Pa.**

**Filed Dec. 8, 1969, Ser. No. 883,212**
**Int. Cl. B25b** *27/14;* **A47b** *13/06*
**U.S. Cl. 29—280** **4 Claims**

A tool is provided, that is adapted to be engaged in the hand of the user, and which has a depressable portion, which actuates jaws adapted for internal engagement of a member. The tool is particularly useful for reaching into automobile engines and the like, and working loose and removing valve tappets, and then lifting the tappets up through the engine,



with the jaws or grips of the tool in engagement internally of the tappets.

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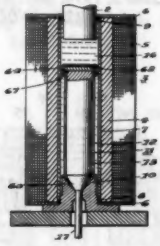
**3,654,687**

## HYDROSTATIC EXTRUSION OF COMPOUND MATERIAL

**Martin Burstrom, Overklinten, and Jan Nilsson, Robertsfors, both of Sweden, assignors to Almanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden**

**Original application Sept. 9, 1968, Ser. No. 758,308. Divided and this application Apr. 27, 1970, Ser. No. 32,195**
**Claims priority, application Sweden, Sept. 27, 1967, 13258/67**
**Int. Cl. B21c** *23/22*
**U.S. Cl. 29—421** **6 Claims**



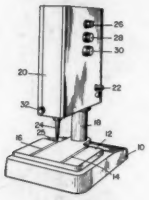
In hydrostatic extrusion of a wire or rod of one metal with a casing of another metal, a billet is extruded through a die from a pressure chamber provided with a conical surface adjacent the die opening. The billet is so constructed that fluid is prevented from entering between the core and the casing and that the axial forces created by the differences in moulding resistance of the different materials are transferred between the casing and the core. This may be done by providing a member which overlies the rear ends of the casing and core. The joint between the casing and core is sealed at the rear ends. The front end of the core is shaped to match the conical surface of the die, and the casing may be brought down over this front end, the front end of the casing tapering in thickness.

3,654,688

## SYSTEM FOR INSERTION TOOL CONTROL

Paul C. Setzler, Sherman, Conn., assignor to Heli-Coil Corporation, Danbury, Conn.

Filed Dec. 11, 1969, Ser. No. 884,194
Int. Cl. B23p 11/00
U.S. Cl. 29—240 6 Claims



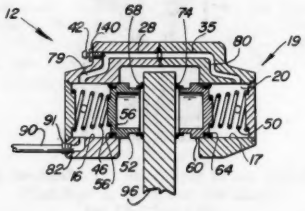
A method for controlling the rotative and translational movement of an insertion tool adapted to securably embed inserts in thermoplastic bodies is set forth along with a control system for implementation of the method. The method involves the steps of imparting rotational and extending forces to a tool threadably carrying an insert to partially liquify a thermoplastic body and seat the insert in a desired registration therein, discontinuing the rotational force and maintaining the extending force during an adjustable time period to permit resolidification of the molten thermoplastic body, thereafter discontinuing said extending force and applying both a reverse rotative force and a retracting force to said tool to dethreadingly retract same from said seated insert. In its preferred form the control system for implementation of the method includes fluidic logic control means.

3,654,689

## METHOD AND APPARATUS OF ASSEMBLING AND DISASSEMBLING HYDRAULIC DISC BRAKE CALIPERS

Maurice L. Schwarz, Middletown, Conn., assignor to The EIS Automotive Corporation, Middletown, Conn.

Filed June 3, 1970, Ser. No. 42,961
Int. Cl. B23p 19/02
U.S. Cl. 29—427 5 Claims



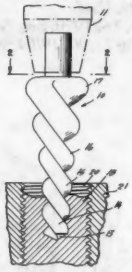
A method and apparatus for releasing frozen pistons from a disc brake caliper assembly by removing said assembly from a vehicle, removing the brake pads therefrom and placing it on a work table. The work table has a self-contained hydraulic system and a vacuum line is also provided. A spacer block of predetermined thickness is placed between the opposed pistons, and a pressure line connected to the caliper assembly. A hand pump is used to increase system pressure until all the hydraulic pistons, including any frozen pistons, move out of their bores to engage the spacer block. The hydraulic pressure is then released by a manual valve, and the hydraulic line disconnected so that the spacer block can be removed and the defective pistons removed from the caliper assembly. The defective piston, or pistons, are replaced by operable ones, and the vacuum line used to drawn them into their bores, after which the caliper assembly is prefilled with hydraulic fluid and pressure tested prior to reinstallation in the vehicle.

3,654,690

## METHOD FOR REMOVING BROKEN STUDS

Wise J. Hardin, 301 Lexington Avenue, Box 22, Volusia County, Fla.

Filed July 2, 1970, Ser. No. 52,004
Int. Cl. B23p 19/06
U.S. Cl. 29—427 2 Claims



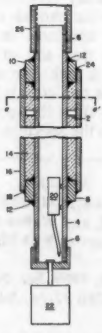
A method for removing a broken threaded member from a tapped bore including a drill bit adapted for rotation in the same direction required to withdraw the broken threaded member and in which a portion of the drill bit between the ends thereof has an expanding diameter to increase the torque for removing the broken threaded member when the drill bit had drilled sufficiently into the broken threaded member to reach the expanding portion.

3,654,691

## PROCESS FOR CONSTRUCTING PRESTRESSED CONDUIT FOR HEATED FLUIDS

Glen Paul Willhite, and William L. Martin, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Original application Feb. 7, 1966, Ser. No. 525,573, now Patent No. 3,511,282. Divided and this application Oct. 20, 1969, Ser. No. 871,239
Int. Cl. B23p 11/02
U.S. Cl. 29—446 9 Claims



A process for constructing conduits of at least 30 feet in length within a conduit of a similar length wherein both conduits are joined in prestress.

3,654,692

## METHOD OF MAKING FRICTION DISC VARIATORS

Bernard Goetz, Colombes, France, assignor to Automobiles Peugeot, Paris and Regie Nationale Des Usines Renault, Billancourt, France

Filed Nov. 21, 1969, Ser. No. 878,671
Claims priority, application France, Feb. 7, 1969, 6902820
Int. Cl. B23p *13/04*
U.S. Cl. 29—558 3 Claims

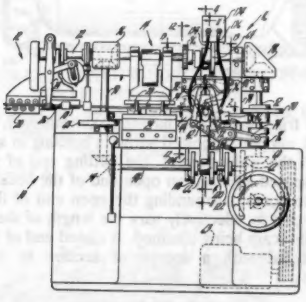
A method for treating surfaces of contact for a friction element operating in a liquid medium. The method comprises sand blasting the surface so as to form unevenness, thereafter nitriding the surface layer so as to increase the hardness and thereafter effecting a partial smoothing to eliminate the crests of the unevenness.

3,654,693

## FOUR-SLIDE MACHINE FOR PRODUCING BEARINGS AND THE LIKE

Erman V. Cavagnero, Torrington, Conn., and Joseph F. Loftus, Springfield, Ohio, assignors to The Torrington Manufacturing Company, Torrington, Conn.

Original application Apr. 16, 1968, Ser. No. 721,672, now Patent No. 3,562,473. Divided and this application June 8, 1970, Ser. No. 44,070
Int. Cl. B21d *9/05*; B21l *3/00*
U.S. Cl. 29—564 7 Claims



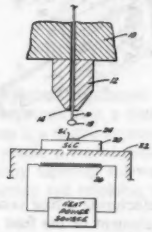
A high production machine of the vertical four-slide type for intermittently advancing strip stock, severing blanks therefrom, forming the same into bearing races and welding end portions thereof together. The machine has a projecting horizontal mandrel with three work stations therealong respectively for preforming, forming, and preheating and/or welding. A cut-off anvil, transfer pins, broaching tools, and an expandable mandrel section are provided all with rear motion drive action and a welding mechanism is adapted for both preheat and weld operation adjacent the expandable mandrel section. A bearing race discharge track extends from the welding station to an induction furnace.

3,654,694

## METHOD FOR BONDING CONTACTS TO AND FORMING ALLOY SITES ON SILICONE CARBIDE

Howard L. Dunlap, Granada Hills, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 28, 1969, Ser. No. 819,832
Int. Cl. B01j *17/00*; H01l *5/04*, *7/60*, *9/08*, *11/02*, *11/04*, *15/08*
U.S. Cl. 29—587 18 Claims



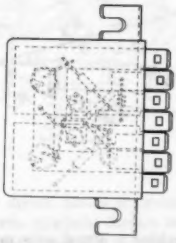
An alloy of silicon and metal (e.g., gold) formed at the eutectic temperature thereof permits the formation of a bonded contact of the metal (e.g., gold) to silicon carbide. Such a contact is useful for securing a wire to the silicon carbide, for forming alloy sites thereon, etc. A nail head bonder with a threadable heated tip may be utilized in the use of this method.

3,654,695

## METHOD OF MAKING AN ELECTRONIC MODULE

Italo Del Gaudio, Napoli, Italy, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed July 29, 1970, Ser. No. 59,232
Int. Cl. H05k *3/20*
U.S. Cl. 29—593 3 Claims



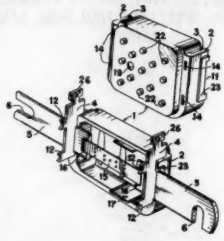
An electronic module is provided by positioning a plurality of metallic elements of interconnection in a desired pattern, attaching active and passive components to the elements of interconnection and encapsulating the elements and components in a thermally conductive, electrically insulative encapsulent. The encapsulent maintains the several parts of the module in a desired fixed spatial relationship with one another, as well as protecting and supporting parts of the module. The elements of interconnection are provided with terminal portions which project out of the encapsulent and some or all of the elements can be proportional to serve as heat sinks for the components.

3,654,696

## METHOD FOR MANUFACTURING ELECTRIC FUSES

Bernard Wechsler, and Roger Wechsler, both of 3, Avenue Valvein, 93 Montreuil, France

Filed Jan. 29, 1970, Ser. No. 6,674
Int. Cl. H01h 69/02
U.S. Cl. 29—623 9 Claims



Method for manufacturing a fuse comprising, prior to fixing the responsive element of the fuse to the two strips for connecting the element to the electric circuit, fixing the two strips at a fixed distance apart in a case of insulating material. The responsive element is thereafter soldered to the two strips and the interior of the case is closed off and filled with powdered material. The case is then finally closed.

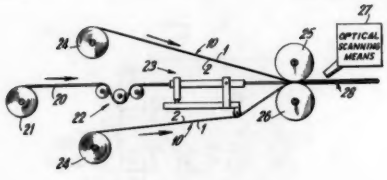
Various embodiments of the fuse obtained are disclosed.

3,654,697

## METHOD OF MAKING THIN PLATED WIRE MEMORY

John M. Cole, New Hope, Pa., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Oct. 19, 1970, Ser. No. 81,915
Int. Cl. H01f 7/06
U.S. Cl. 29—604 10 Claims



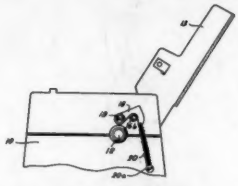

A method of making a plated wire memory plane comprises laminating two sheets of copper clad dielectric material around a plurality of generally parallel manufacture wires in a continuous lamination technique, with each copper sheet having suitable apertures therein to enable inspection of the spacing or pitch between said manufacture wires during lamination step. Suitable tooling holes are drilled in the resulting laminated structure, after which the copper foil sheets are etched to produce the word lines which extend generally perpendicular to the manufacture wires, and with the word lines being in registration above and below said manufacture wires. The latter are then withdrawn from the dielectric material and magnetically plated wires are inserted in the resulting tunnel thereby completing the memory plane.

3,654,698

## CAN OPENER WITH REMOVABLE HAND LEVER AND CUTTING ELEMENT

Robert J. Scott, Blue Springs, Mo., and Leo F. Aberer, Shawnee Mission, Kans., assignors to Rival Manufacturing Company, Kansas City, Mo.

Filed Oct. 17, 1969, Ser. No. 867,231
Int. Cl. B67b 7/38
U.S. Cl. 30—4 R 7 Claims



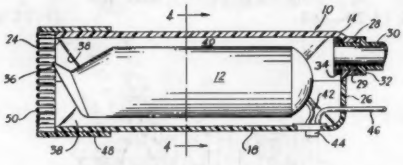
An electrically powered can opener has a cutter wheel carrying hand lever pivotally attached to its forward upright frame by an elongate pin member. A spring biased latch is pivotally affixed to the inner surface of the upright frame and located relative to an aperture therein so that the latch releasably locks the pin member (and the hand lever) to the can opener frame. The inwardly extending pin member of the pin assembly is selectively grooved so that when same is in a preselected position, the groove is engaged by the latch and when the hand lever is rotated to a preselected position, the spring biased latch rides out of the groove in the pin member allowing the hand lever to be removed from the aperture in the can opener frame.

3,654,699

## HAIR TRIMMING DEVICE

Ralph Garcia, C/O Mrs. Paul Barnes, Route 8, Box 32, Winston-Salem, N.C.

Filed July 17, 1970, Ser. No. 55,761
Int. Cl. B26b 19/44
U.S. Cl. 30—133 6 Claims



A hair trimming device having a conventional, electrically operated, clipper supported within a housing in spaced relation with the walls thereof, the cutting end of the clipper being disposed adjacent an open end of the housing, and an adjustable comb, surrounding the open end of the housing, and movable to selectively vary the length of the hair to be left on the scalp being trimmed. A closed end of the housing is connected with a source of suction to remove the clippings.

3,654,700

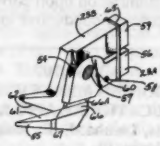
## POWERED CUTTING TOOL AND CUTTING HEAD THEREFOR

James A. Pawloski, P.O. Box 158, East Woodstock, Conn.

Filed Aug. 5, 1969, Ser. No. 847,570
Int. Cl. B26b 13/04
U.S. Cl. 30—247 3 Claims

This disclosure is directed to a powered cutting tool and a cutting head adapted for use therewith comprising a housing

for containing a motor means and an actuator for controlling the operation of the motor means. A cutting head is connected in driving relationship with the motor means. The



cutting head includes a pair of relatively movable jaws having a by-pass disposed in substantial alignment with the shear line of the jaws so as to prohibit curling of the material or binding of the tool during a cutting operation.

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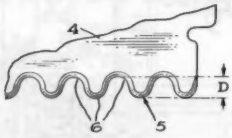
**3,654,701**
**SAFETY RAZOR BLADE**
**Donald M. Hastings, Sr., P.O. Box 4088, Atlanta, Ga.**
**Filed June 29, 1970, Ser. No. 50,724**
**Int. Cl. B26b** *21/54*
**U.S. Cl. 30—346.56** **1 Claim**



An improved safety razor blade having a cutting edge in the form of a continuous series of substantially sinusoidal micro-waves which provide more cutting surface per unit of length than a smooth- or straight-edged blade and which achieve maximum closeness and comfort of shaving action without angling the blade to the direction of the shaving stroke. The improved blade is adaptable to most of the standard safety razors utilizing either single- or double-edge blades, as well as those of the narrow band or reel type flexible blades. For optimum results, the micro-waves of the cutting edges of the blades are very minute and preferably range in wave depth from crest to trough on the order of between 0.0005 inch minimum depth to about 0.0050 inch maximum depth, and the waves numbering on the order from between about 100 or 200 per inch to about 20 per inch of blade length.

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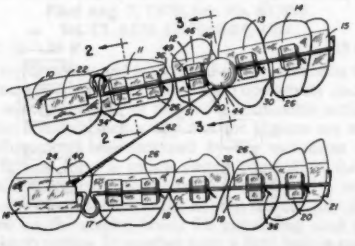
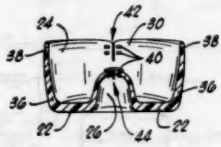
**3,654,702**
**NON-CUMULATIVE-FORCE SPRING FOR ORTHODONTIC DEVICES**
**Vincent M. Kelly, Jr., 5930 East 31st Street, Tulsa, Okla.**
**Filed Jan. 21, 1969, Ser. No. 792,248**
**Int. Cl. A61c** *7/00*
**U.S. Cl. 32—14 A** **5 Claims**



A force powered drum and cable device is utilized in place of latex elastic means in orthodontic correction systems.

**3,654,703**
**DENTAL IMPRESSION TRAY**
**Harold L. McAdoo, 501-3 Union National Bank Building, Bartlesville, Okla., assignor to Charlotte M. McAdoo**
**Filed Jan. 27, 1970, Ser. No. 6,062**
**Int. Cl. A61c** *9/00*
**U.S. Cl. 32—17** **3 Claims**



This invention is a dental impression device for holding dental impression compound. It is a dental tray. More particularly, this invention is a dental impression tray formed of a pliable polymeric plastic material, with a relatively thick base portion and thinly tapering sidewalls; the tray being easily modified by cutting and rejoining to provide a proper fit.

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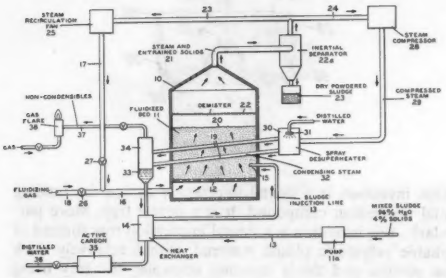
**3,654,704**
**AUTOMATIC SCRIBER**
**Leslie J. Poglein, Box 291A, R.D. 1, Jeannette, Pa.**
**Filed Dec. 3, 1970, Ser. No. 94,718**
**Int. Cl. B43l** *13/00*
**U.S. Cl. 33—18 B** **8 Claims**

A mechanically driven device is provided for forming or writing letters, words, symbols, designs or caricatures in accordance with programming of a pattern piece and for applying them to a piece of paper through an agency of linkage of a lever mechanism and a stylus. The pattern piece is formed by using the stylus as a tracing guide and by applying a pair of tracking pins to trace contour lines on the pattern piece; the pattern piece is then formed by cutting it along the contour lines. The pattern piece is introduced in an aligned relation into the machine and rotated about a drum or wheel in the path of the pair of tracking pins that then operate as opposed side-edge-engaging fingers along the contoured edges of the pattern piece. The tracking pins are connected through linkage to a stylus operating arm for moving a pen or pencil to faithfully translate and apply a lettering or design in accordance with contouring of the advancing pattern piece.

## 3,654,705
## FLUIDIZED BED VAPOR COMPRESSION DRYING APPARATUS AND METHOD

Richard D. Smith, Palo Alto, and Dale A. Furlong, Sunnyvale, both of Calif., assignors to Combustion Power Company, Inc., Palo Alto, Calif.

Filed Jan. 11, 1971, Ser. No. 105,270
Int. Cl. F26b 3/08
U.S. Cl. 34—10 25 Claims

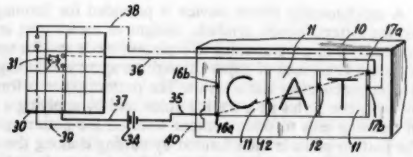



A feed stream, which is to be dried, is introduced into a fluidized bed of solid particles. A plurality of conduits are immersed in the bed for channeling a heating fluid through the bed to supply heat for vaporizing volatiles contained in the feed stream. Solid particulates and volatiles produced within the hot bed are removed from the bed. Volatiles are separated from the solid particulates entrained therein whereupon dried feed solids are recovered. The separated volatiles are preferably split into a first and a second portion. The first portion is recycled to the bed to serve as the fluidizing gas. The second portion is compressed to a pressure at which its saturation temperature exceeds the boiling temperature of the feed stream at the conditions existing in the bed. The compressed second portion is then cooled to about its saturation temperature whereupon it is re-cycled through the bed heating conduits to serve as the heating fluid. The recycled compressed volatiles condense as they pass through these conduits to supply heat for vaporizing the volatiles contained in the feed stream.

## 3,654,706
## EDUCATIONAL DEVICE

Donald J. Perrella, 38 Drexell Lane, Matawan, N.J.

Continuation-in-part of application Ser. No. 657,316, July 31, 1967, now abandoned. This application June 23, 1970, Ser. No. 48,988
Int. Cl. G09b 5/00
U.S. Cl. 35—9 D 10 Claims

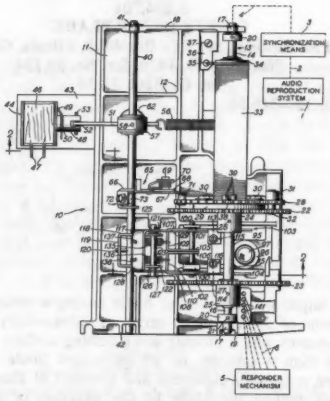



This invention relates to an educational device, and particularly to an electrical teaching machine for young children. The inventive device utilizes a plurality of electrically conductive means which bear symbols, such as alphabet letters or mathematical symbols. A conductive path is provided upon correct arrangement of predetermined groups of letters to spell words, or arrangement of predetermined mathematical symbols to perform arithmetic operations. A chassis or housing incorporates electrically responsive means adapted to provide sensory stimulation upon correct arrangement of a plurality of the electrically conductive means.

## 3,654,707
## IMAGE POSITIONING MEANS FOR AUDIOVISUAL EDUCATIONAL APPARATUS

Richard W. Roberts, Lombard, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Apr. 7, 1970, Ser. No. 26,382
Int. Cl. G09b 7/00; G03b 23/08
U.S. Cl. 35—9 A 6 Claims

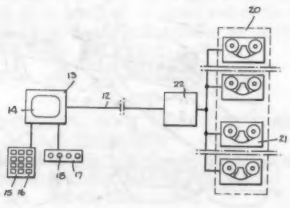



A device for releasably clamping an image support in an audiovisual educational apparatus to hold images carried by the support in a single common plane for visual presentation despite intermittent movement of the image support relative to the apparatus, thereby avoiding the necessity for frequent adjustment of the visual presentation for sharpness. The device is operable to release the image support to permit the intermittent relative movement to be effected freely and rapidly.

## 3,654,708
## COMPUTER-ASSISTED INSTRUCTION VIA VIDEO TELEPHONE

Harvey J. Brudner, Piscataway, N.J., assignor to Westinghouse Learning Corporation, Iowa City, Iowa

Filed May 26, 1969, Ser. No. 827,868
Int. Cl. G09b 7/04; H04m 11/00
U.S. Cl. 35—9 A 10 Claims



A teaching system utilizing a video telephone as a terminal in which the video telephone is tied into a computer whereby

information is fed into the video telephone and other information is transmitted to the computer. A video tape recorder, containing a central bank of pre-recorded reels of video tape, is connected to the central processing unit of the computer and the video telephone whereby pictorial representations as distinguished from the alpha-numerical representations will appear on the screen of the video telephone enabling interaction with the student. This central bank of pre-recorded reels of video tape is connected to a buffer unit so that selected tape reels can be transfer recorded into the buffer unit where it is played back to the student selecting such tape. In this manner, the pre-recorded reels of video tape in the central bank will be available almost simultaneously to a large number of students at different terminal units in the teaching system.

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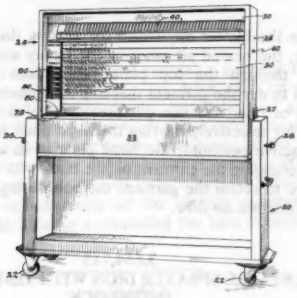
**3,654,709**
**VOTER INSTRUCTION DEVICE**

**Afton V. Martin, and Michael T. Modovan, Jr., both of Jamestown, N.Y., assignors to AVM Corporation, Jamestown, N.Y.**

**Continuation of application Ser. No. 797,811, Feb. 10, 1969, now abandoned. This application Dec. 30, 1970, Ser. No. 102,914**
**Int. Cl. G09b *25/02*; G07c *13/00***
**U.S. Cl. 35—13** **9 Claims**



A voting machine familiarization and/or operating instruction aid, comprising a machine frontally simulating a complete official voting machine but embodying in unique combination only operational components which are essential to indoctrination of prospective voters to accurate and efficient use of the simulated type complete and official machine.

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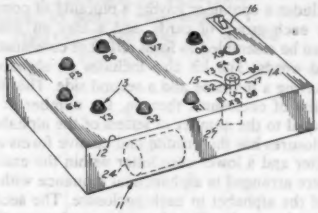
**3,654,710**
**SELECTIVELY ILLUMINABLE TOY**

**James W. Barnard, 5927 So. Elizabeth Way, Littleton, Colo.**

**Filed Aug. 7, 1970, Ser. No. 61,989**
**Int. Cl. A63h *33/26*; H03j *1/04***
**U.S. Cl. 35—29 R** **13 Claims**

In a toy to amuse and teach hand-eye coordination to children, there is provided a control knob operatively associated with a selected number of distinctive illuminable stations on a display board in such a way that the stations are sequentially illuminated and darkened by the movement of the knob. In one form a rotary switch coupled to the knob sequentially connects power from a battery to a separate light bulb at each station as the knob is turned and indicia is provided on the display board for correlating each station with a knob setting. In another form a light bulb is mounted on a radial arm secured to the knob to rotate to each station as the knob is turned, and in yet another form light from a common light bulb is transmitted to each station via a light-conductive rod coupled to the knob. An on-off power switch



on the display board is connected in series between the battery and the light bulb or bulbs.

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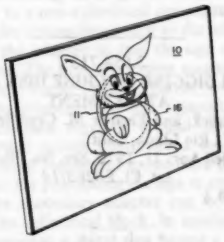
**3,654,711**
**TEACHING AID**

**Lowell M. Taylor, P.O. Box 224, Kaysville, Utah**

**Filed Feb. 16, 1970, Ser. No. 11,695**
**Int. Cl. B43l *1/04***
**U.S. Cl. 35—66** **2 Claims**



A teaching aid usable as a chalk board and for displaying movable objects. The teaching aid includes a board having a sandwich construction comprising rigid center core, a lamination of magnetic material such as thin sheet steel or steel foil on at least one side of the center core and a covering of book cloth material on both flat faces of the board. Magnetized rubber or vinyl members are coated so that they will stick to the face of the board having the magnetic sheet therebeneath but so that they are easily slidable thereover.

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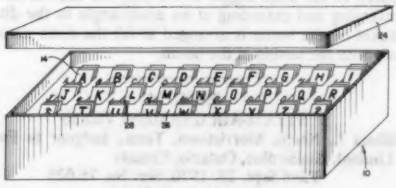
**3,654,712**
**TEACHING AID KIT**

**Florica Bagdasar, 5901 N. Sheridan Rd., Apt. 13-A, Chicago, Ill.**

**Filed Dec. 31, 1969, Ser. No. 889,559**
**Int. Cl. G09b *1/06***
**U.S. Cl. 35—73** **12 Claims**



The kit includes a plurality of groups of cards with each card having a letter of the alphabet marked thereon. Each

card in each group (e.g., five cards per group) has an upper case letter form marked on a first surface thereof and a lower case letter form marked on a second surface thereof. The kit also includes a container having a plurality of compartments, one for each group of cards, and a tray on which various cards can be assembled to form different combinations of letters and words. The kit also includes an alphabet learning tablet having a first side and a second side. The first side has a plurality of enclosures thereon, the number of enclosures being equal to the number of letters of the alphabet. Each of the enclosures has the printed and cursive forms of an upper case letter and a lower case letter within the enclosure. The letters are arranged in alphabetical sequence with a different letter of the alphabet in each enclosure. The second side of the tablet has a plurality of graphic enclosures thereon and each of the graphic enclosures has a picture of an article or thing and the word for the article within the enclosure. The first letter of each word is a different letter of the alphabet and the words are arranged so that the first letter of each word is in alphabetical sequence with respect to the first letter of the word in an adjacent graphic enclosure. Additionally, the kit includes a card for each letter of the alphabet which has the printed and cursive forms of an upper case and a lower case letter on a first surface thereof identical to the letter forms in one of the enclosures on the first side of the tablet and a picture of an article or thing and a word for the article on the second surface of the card identical to the picture and word in one of the graphic enclosures on the second side of the tablet.

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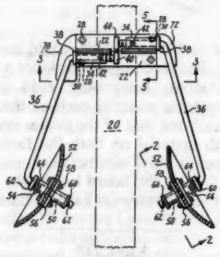
**3,654,713**
**DITCH DIGGING MACHINE DISK AUGER ATTACHMENT**

**Elmer C. Craddick, and Eleanor M. Craddick, both of 6236 West 2nd ST., Rio Linda, Calif.**

**Filed Apr. 21, 1970, Ser. No. 30,465**
**Int. Cl. E02f 5/14**
**U.S. Cl. 37—80 A** **1 Claim**



A disk auger attachment for ditch digging machines pivotally mounted on the boom of the ditch digger for engaging the ground adjacent the sides of the ditch to move loose earth adjacent the ditch away from the ditch and to remove earth from the edges of the ditch for preventing caveins thereof. A pair of disks are mounted on arms pivotally secured to the ditch digger boom with the axes of the disks converging and extending at an acute angle to the ditch. A bracket on the boom is arranged to lift the disks simultaneously with the raising of the boom.

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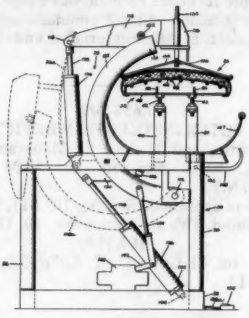
**3,654,714**
**STEAM-AIR GARMENT PRESS**

**William L. North, Morristown, Tenn., assignor to Forenta, Limited, Kincardine, Ontario, Canada**

**Filed Sept. 28, 1970, Ser. No. 76,029**
**Int. Cl. D06f 71/34**
**U.S. Cl. 38—16** **15 Claims**

A steam-air garment press, such as a utility press or legger. A horizontally extending buck is provided comprising a perforated metal top plate joined to a metal base member and defining a cavity therewith. A porous metal pad is provided on the outer surface of the top plate, and a heating element is provided in the cavity carried on the inner surface of the top plate for continuously heating the top plate and pad. Elongated, flattened, perforated tubes are carried on the outer surface of the top plate under the pad for selectively injecting steam into the pad for outward flow therethrough thereby to heat and moisten a garment thereon. A blower communicates with the buck cavity and a heating element is pro-



vided in the blower air stream for heating the air delivered thereby, the heated air entering the cavity and flowing outwardly through the top plate perforations and the pad thereby to dry the garment thereon. An unheated head plate formed of relatively thin perforated metal is provided with means for selectively moving the head plate between active and inactive positions, the head plate in its active position lightly engaging the garment on the buck with only sufficient pressure to retain the garment thereon during the steam injection and hot air flow.

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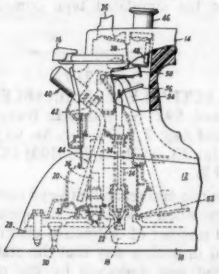
**3,654,715**
**ADJUSTABLE SPRAYER IRON WITH TEMPERATURE INTERLOCK**

**William E. Davidson, Ontario, and Llewellyn D. Busby, Upland, both of Calif., assignors to General Electric Company**

**Filed Nov. 25, 1970, Ser. No. 92,587**
**Int. Cl. D06f 75/06**
**U.S. Cl. 38—77.5** **7 Claims**

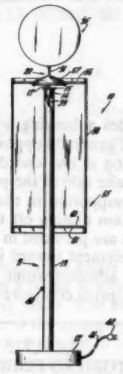


The disclosure shows a spray iron having independent adjustable sprayer assembly and temperature control means with interlocking connecting structure between the two for automatically setting the correct spray rate in accordance with the temperature setting for the material being ironed.

## 3,654,716
## MOTOR OPERATED POLE SUPPORTED MOTION DISPLAY

Jerome A. Moss, 333 West End Ave., New York, N.Y.

Filed Dec. 28, 1970, Ser. No. 101,585
Int. Cl. G09f 11/02
U.S. Cl. 40—33 12 Claims



This display comprises a pole carrying a motor at its upper end, having an upwardly extending drive shaft on which is mounted means to facilitate the installation of a display member in the field and to support and stabilize the weight of the display member more evenly as opposed to the conventional "U" bracket. The display member is simply lifted over the support unit, and lowered onto a conical portion of an adoptor for self-centering of the display member which finally rests on a flange surrounding the base of said conical portion.

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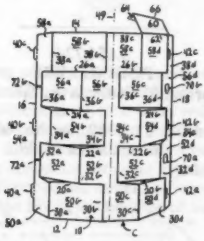
## 3,654,717
## DISPLAY DEVICE

John Lane, 10359 Longview Dr., Kirtland, Ohio

Filed May 14, 1970, Ser. No. 37,092
Int. Cl. G09f 1/06
U.S. Cl. 40—126 A 4 Claims

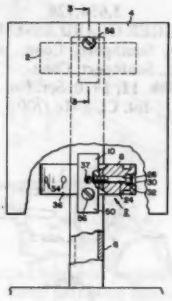


A self-supporting tubular, geometrical product display and/or advertising device formed of a sheet of foldable material, such as, posterboard, cardboard and the like, having at least four sides each providing a plurality of display surfaces or areas, and simulating a plurality of non-aligned rectangular blocks, cartons, boxes, or the like, placed one upon another.

## 3,654,718
## ADAPTER FOR ATTACHING SIGNS TO A NON-CYLINDRICAL SIGNPOST

Louis A. Bianchi, 83 Bond St., Rochester, N.Y.

Filed Oct. 2, 1969, Ser. No. 863,048
Int. Cl. G09f 7/18
U.S. Cl. 40—145 9 Claims



An adapter including first connection means for connecting the adapter to a non-cylindrical signpost and second connection means for connecting a sign to the adapter at any location around the adapter so that the sign can face in any desired direction. The first connection means is preferably a cylindrical block made in two halves with an opening therebetween to accommodate the signpost when the two halves are connected together around the signpost. The second connection means comprises a secondary adapter mounted for sliding movement around the periphery of the cylindrical block for positioning the sign at any desired facing orientation. The secondary adapter can be locked against movement to the cylindrical block. In another embodiment, the adapter comprises a metal ring having a plurality of circumferentially spaced-apart perforations therethrough. One perforation is used to connect the adapter to the non-cylindrical signpost, and the sign can be connected to any one of the other perforations at a selected position around the periphery of the ring.

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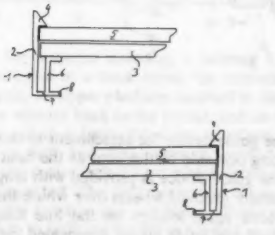
## 3,654,719
## QUICK-CHANGE PICTURE MOUNT

Gunter Rochelt, Wagnerstrabe 113, P777, Ulm, Germany

Filed Jan. 22, 1968, Ser No. 699,442. The portion of the term of the patent subsequent to Apr. 11, 1988, has been disclaimed.
Int. Cl. G09f 1/12
U.S. Cl. 40—156 9 Claims



Clamping bars embrace the edge of a glass pane and hold it against a rear wall. The clamping bars are disposed on two opposite sides of the mount and comprise each a spring loop

having shorter and longer spring legs. The shorter spring leg is connected to the rear wall. The longer spring leg has a free end portion formed on its inside with a detent nose, which tapers toward the extreme outer end of the longer leg so that the same can yield resiliently when the glass pane is urged against the detent noise until the latter snaps in over the glass pane to hold the same in position on the rear wall.

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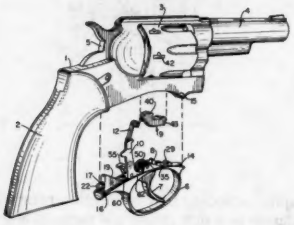
**3,654,720**
**TRIGGER GUARD ASSEMBLY**

**William B. Ruger, Southport, Conn., assignor to Sturm, Ruger & Co., Inc., Southport, Conn.**

**Filed Feb. 11, 1970, Ser. No. 10,526**
**Int. Cl. F41c** *1/00*
**U.S. Cl. 42—75 A** **9 Claims**



A removable trigger guard assembly for firearms which in its preferred embodiment includes the trigger guard having a trigger, a trigger spring, a cylinder actuating pawl, a hammer transfer bar and means for retaining the crane shaft mounted thereon. Means are provided for removably securing the trigger guard to the revolver frame, whereby the trigger guard and said connected elements can be removed from and returned to the revolver frame as a unit. The trigger guard has a key or insert connection at one end, preferably the front end and a releasable lug at the opposite end in resilient engagement with the revolver frame which can be depressed to release said engagement and remove the trigger guard assembly.

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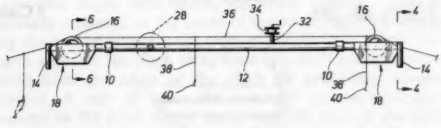
**3,654,721**
**TROT LINE GUIDE DEVICE FOR BOATS**

**Wesley B. Coleman, 4723 West Alabama, Apt. 4, Houston, Tex.**

**Filed Sept. 21, 1970, Ser. No. 73,885**
**Int. Cl. A01k** *79/00*
**U.S. Cl. 43—6.5** **6 Claims**

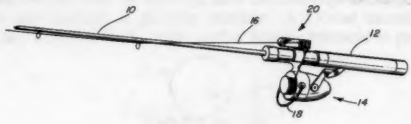


A line guide device for attachment to boats to guide a trot line along one side of the boat as the boat moves along the line. The guide device is provided with longitudinally spaced peripherally grooved wheels over which the line passes with the spaced apart leaders on the line hanging downwardly therefrom, and guide means is provided for retaining the line in the grooves of the wheels and for guiding the leaders in their downwardly extending positions past the wheels to prevent tangling of the leaders in the equipment or snagging of the hooks.

**3,654,722**
**FISH LINE HOLDER**

**Francis P. Camilleri, 30 West Street, Rocky Hill, Conn.**

**Filed Feb. 9, 1970, Ser. No. 9,564**
**Int. Cl. A01k** *87/00*
**U.S. Cl. 43—25** **6 Claims**



The device includes a housing with means for mounting the same to the pole generally opposite the reel and includes an L-shaped extension at one end defining a slot, or cavity, located on the opposite side of the pole from the reel. A ball element is slidably supported in the housing for movement from and to a position closing off the cavity, and a pair of compression springs are provided in series inside the housing for urging the ball element toward its closed position with a force which can be adjusted within two distinct ranges as a result of the double spring configuration disclosed herein.

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**3,654,723**
**MOTORIZED FISHING LINE**

**Joe F. Mercer, 302 E. Wallace St., Gonzales, Tex.**

**Filed Apr. 9, 1969, Ser. No. 814,691**
**Int. Cl. A01k** *97/00*
**U.S. Cl. 43—26.1** **2 Claims**

A motorized fishing line structure comprising a fishing line formed into a closed loop and passing around a pair of pulleys disposed in spaced-apart positions in a body of water. The line also passes around a third pulley on shore which has a motor connected thereto to rotate the line continuously around the pulleys. Fish hooks are secured to the line in spaced relationship so as to be movable therewith through the water.

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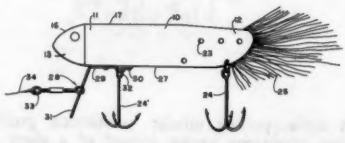
**3,654,724**
**FISHING LURE**

**John R. E. Charron, 91 Sadler Ave., Winnipeg, 8 Manitoba, Canada**

**Filed Oct. 21, 1969, Ser. No. 868,163**
**Int. Cl. A01k** *85/00*
**U.S. Cl. 43—42.06** **1 Claim**



A hollow lure with a spring-loaded detachable cap on one end so that lure materials such as blood, liver, worms, etc.,

together with weights, if desired, can be placed inside the lure. Apertures at the rear permit ingress of water and egress of particles or leached lure materials.

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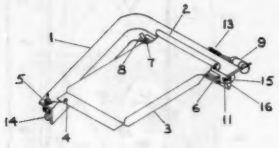
**3,654,725**
**FISH BAIT DISPENSER**
**William Kingston, 47 Mespil Rd., Dublin 4, Ireland**
**Filed Mar. 2, 1970, Ser. No. 15,356**
**Claims priority, application Ireland, Mar. 5, 1969, 285/69**
**Int. Cl. A01k** *61/02*
**U.S. Cl. 43—44.99** **4 Claims**




A vacuum package containing a single dose of the material to be dispensed is held in a frame so that it can be cut open by a spring-loaded sliding blade. The blade is held off the package against the force of the spring by the timer, which is an arrangement of a metal shear pin in contact with another metal of lower electrode potential. Immersion of the timer in an electrolyte such as sea water initiates galvanic action which causes the shear pin to corrode to failure close to a predetermined time.

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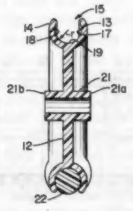
**3,654,726**
**TOY BUILDING SET AND DISC-LIKE UNITS THEREFOR**
**Don C. Witte, Salina Star Route, Boulder, Colo.**
**Filed May 7, 1969, Ser. No. 822,507**
**Int. Cl. A63h** *33/00*
**U.S. Cl. 46—16** **9 Claims**




In a toy building set, disc-like toy unit each have spaced flexible rims defining a peripheral slotted portion between; the rims being undercut along their inner walls and terminating in an inner peripheral concave wall on the hub of the body. A modified form has radially slotted rims. The toy unit serves as a female connector for other toy members sized for a releasable fitted connection thereto or may define a wheel, gear, sprocket or the like in the building of mechanical toys.

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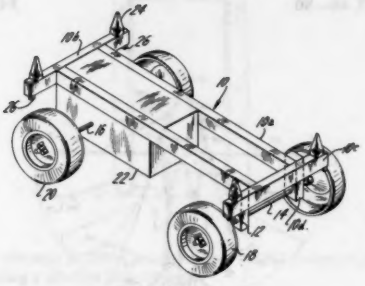
**3,654,727**
**TOY**
**Samuel Span, 447 Ogden Ave., Teaneck, N.J., and Walter Thum, 12-42 Sunnyside Dr., Fair Lawn, N.J.**
**Filed Sept. 25, 1969, Ser. No. 861,114**
**Int. Cl. A63h** *33/06*
**U.S. Cl. 46—17** **7 Claims**

A toy in which random household articles may be assembled to a chassis for realizing a movable toy. The chassis frame retains a front axle and a rear axle upon which wheels are rotatably mounted to enable the chassis to move translationally. Spike-shaped members project upward from the chassis frame for penetrating into an article made of soft material and mounted on top of the chassis to form the body



of a vehicle. Peg-shaped members projecting downward from beneath the chassis frame permit an article to be held to the chassis frame through flexible bands. Various elements are attachable to the article to render a vehicle-driven toy.

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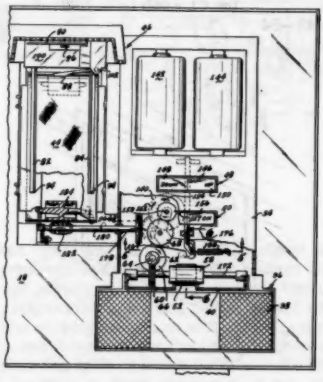
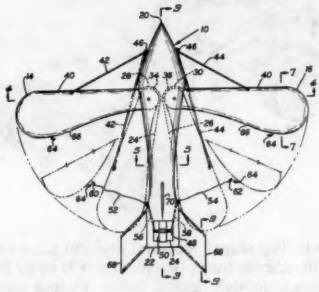
**3,654,728**
**TOY MEANS FOR MEASURING TOY VEHICLE DRAG AND/OR DRIFT**
**Janos Beny, Manhattan Beach; Denis V. Bosley, Palos Verdes Peninsula, and Melvin R. Kennedy, Carson, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.**
**Filed Dec. 5, 1969, Ser. No. 882,525**
**Int. Cl. A63h** *33/30*
**U.S. Cl. 46—39** **4 Claims**



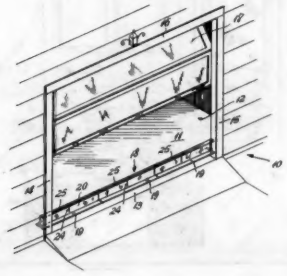
A garage for toy vehicles including a housing having a lower platform coupled to a track layout for receiving vehicles from the layout, an upper platform coupled to the layout for delivering the vehicles back to the layout, and an elevator for carrying toy vehicles from the lower platform to the upper platform. A drift and drag meter is located on the upper platform, the meter including a motor driven belt on which cars are supported. The drag portion of the meter includes a member for abutting one end of the vehicle as it lies on the moving belt, to indicate the force applied to it by the vehicle. The drift portion of the meter includes a pair of rails on either side of the vehicle, which can be moved to either side if the vehicle tends to drift to one side on the moving belt, and a dial for indicating the force and direction of force applied to the rails.

3,654,729
**MODEL AIRPLANE**
Joseph Imperato, Selden, N.Y., assignor to Sport Games, Inc., Great Neck, N.Y.
Filed Sept. 12, 1969, Ser. No. 862,626
Int. Cl. A63h 27/00
U.S. Cl. 46—80 3 Claims



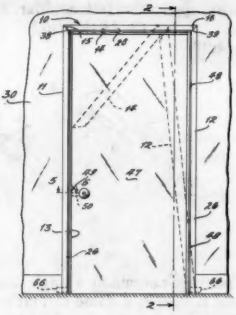
A model airplane having a pivotable wing for imparting superior aerodynamic performance characteristics. Wings are folded toward fuselage during airplane launch and automatically extended outwardly during flight to provide airplane lift surfaces for a gliding descent.

3,654,730
**FLEXIBLE BARRIER**
Alton L. Fraleigh, 7 Toilsome Ave., Norwalk, Conn.
Filed Jan. 26, 1971, Ser. No. 109,853
Int. Cl. E06b 1/70, 7/00
U.S. Cl. 49—34 8 Claims



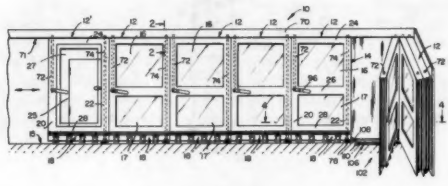
A flexible barrier to be extended across the bottom portion of an opening, for example the door opening in a garage, to intercept foreign matter, such as leaves, snow or dirt. The barrier is preferably formed of elastomeric material and has a broad base to be secured to the floor of the garage and has a flexible wall projecting upwardly from the base in position to engage and prevent said foreign matter from entering the garage, said wall being deflectable to permit a heavy object, such as an automobile, lawn mower, work cart or the like, to pass thereover on entering or leaving the garage without interference and will then return to normal position. The wall can be provided with vertical slits to increase the flexibility thereof and can have a laterally disposed lip or deflector portion extending from the upper edge thereof to intercept the foreign material and deflect it back out through said opening.

3,654,731
**METAL DOOR FRAMES**
Frank J. Jellinek, Bismarck, Mo., assignor to Jelco Mfg. Co., Bismarck, Mo.
Filed Nov. 4, 1970, Ser. No. 86,746
Int. Cl. E06b 1/04
U.S. Cl. 49—504 10 Claims



A metal door frame having two vertical jamb members and an overhead cross-member is improved by providing means to reduce or eliminate door jamb vibration and looseness, and by providing an improved dustbox and strike plate assembly which is easier to install than conventional dustbox and strike plate assemblies and is not as subject as prior constructions to looseness and yet is fully adjustable.

3,654,732
**REMOVABLE CLOSURE**
Louis L. Schacht, 205 East 63rd Street, New York, N.Y.
Filed Nov. 13, 1970, Ser. No. 89,276
Int. Cl. E05d 15/58
U.S. Cl. 49—127 10 Claims



The invention relates to an apparatus having a plurality of independent closure members such as wall panels, screens, partitions, etc. supported on moveable carriages. The carriages are equipped with spring loaded caster members for permitting smooth, translational movement along a trackless floor surface. The caster members on each of the respective carriages are further mechanically linked for synchronized turning. A ceiling guide rail is engageable by two members extending upwardly from the carriage and guide the movement of the closure members from a storage position into a pre-arranged pattern whereby the closure members are aligned in a vertical edge abutting interlocked closure position. One of the members engaging the ceiling guide rail is adapted for selective retraction and another of said members is adapted for continuous engagement within the ceiling guide rail and additionally has floor contacting shoe member which is slidably received within a guide channel located in the storage area. Upon disengagement of the retractable member from the ceiling guide rail, the closure member may

be pivoted and turned about the other rail engaged member and slid into a vertically stacked confronting face to back storage position.

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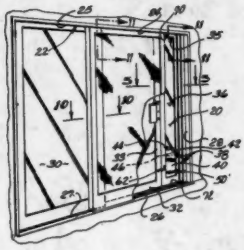
**3,654,733**
**PET-DOOR-CONTAINING INSERT UNIT FOR A SLIDING-DOOR FRAME**
Ray E. Blackwell, c/o P.O. Box 18948, Hawthorne, Calif.
Filed Mar. 5, 1970, Ser. No. 16,900
Int. Cl. E06b 7/28
U.S. Cl. 49—168 4 Claims



A pet-door-containing insert unit for a sliding-door frame of the type including upper and lower, substantially parallel, laterally directed, sliding-door trackways, and end-positioned, vertically directed door jamb, and at least one sliding door cooperating with said sliding-door frame and normally lockingly abuttable with said vertically directed door jamb. The pet-door-containing insert unit includes an insert unit frame adapted to be positioned vertically between the upper and lower trackways of the sliding-door frame, with one side portion thereof being adapted to abut the door jamb of the sliding-door frame and with the other side portion thereof being adapted to abut the laterally movable, vertical edge of a sliding door which normally abuts the door jamb, thus providing a complete closure of the opening defined by the sliding-door frame, said closure comprising, in part, the conventional sliding door and, in part, the pet-door-containing insert unit of the present invention which contains a pet-doorway-defining frame means provided with a normally closed, pet-openable door member positioned thereacross and, in certain forms of the invention, an additional auxiliary, controllably removable sealing door for completely and positively sealing the pet-doorway-defining opening, when desired. In one preferred form, the auxiliary door may be mounted on either side of the pet-doorway-defining frame means.

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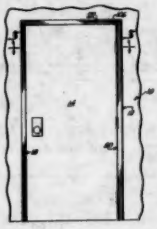
**3,654,734**
**ADJUSTABLE DOOR OR WINDOW FRAME**
Harry W. Lehman, Miami Beach, Fla., assignor to Stratford Industries, Inc., Hialeah, Fla.
Filed June 3, 1969, Ser. No. 829,886
Int. Cl. E06b 1/04
U.S. Cl. 49—505 8 Claims

For use in a door or window opening, an expansible, frame element, frame and corner joint, in which the frame includes pre-assembled U-shaped members which include assembly plates forming sockets receiving a face panel for width adjustments; jamb elements are secured over fastening elements securing the face plates together; the face plates include notches and holes accommodating fasteners after width adjustments have been made; and a corner connector having transverse, triangular ribs extending over mitered corners and into which flanges are deformed to stake the elements and draw them together at the corners; and in which the jamb element includes on one side a lateral undercut slot for receiving a silencer strip therein.



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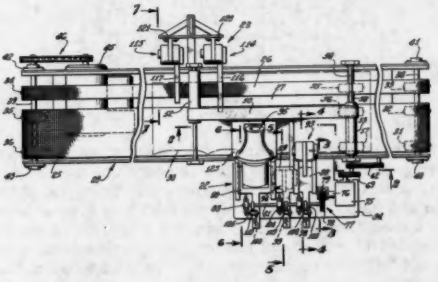
**3,654,735**
**AUTOMATIC CONTOURING MACHINE FOR FOAM BLANKS**
Carlos A. Gentile, Westminster, Calif., assignor to Califoam Corp. of America, Compton, Calif.
Filed Sept. 14, 1970, Ser. No. 71,759
Int. Cl. B24b 7/00
U.S. Cl. 51—5 12 Claims



Chain belt conveyor for continuous transport of foam blanks at predetermined speed past work stations where the forward edge portion of a blank is shaped, trimmed and buffed, by reciprocating knives and a buffer wheel, which are advanced into working position or retracted by programming cam mechanism driven in synchronism with the conveyor, and a reciprocating knife or knives operate on the rear edge portion of the blank to shape and trim such rear edge portion, the purpose being to produce from a foam blank of generally rectangular plan and cross section a pad of the desired plan form and cross sectional contour for use as a filler in a cushion or an upholstered automobile seat.

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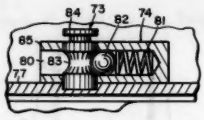
**3,654,736**
**BLADE-RETENTION SYSTEM FOR A BLASTING MACHINE**
John E. De Groot, Grand Rapids, Mich., assignor to Benfur Engineering Company, Grand Rapids, Mich.
Filed Sept. 8, 1969, Ser. No. 856,079
Int. Cl. B24c 3/04
U.S. Cl. 51—9 4 Claims

A locking system for blasting machine blades is based upon locking members mounted in the spacers maintaining the

relative position of axially spaced wheel discs receiving the blades in radial grooves. The blades extend radially beyond




the periphery of the wheel discs, and have an offset engaging the peripheral surface to limit inward blade movement.

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**3,654,737**

**PRECISION HONING MACHINE**

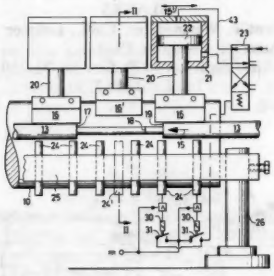
**Thomas Schmidt, Munchingen-Kallenberg, Germany, assignor to Supfina, Wieck & Hantzen, Remscheid, Germany**

**Filed June 25, 1970, Ser. No. 49,715**

**Claims priority, application Germany, June 30, 1969, P 19 33 106.7**

**Int. Cl. B24b** *5/04*

**U.S. Cl. 51—66** **11 Claims**



A honing machine for rods of stepwise varying diameters having sensors for sensing the diameter and controlling magnetic valves for hydraulically moving the honing members into and out of engagement with a workpiece. The sensors are contact-free magnetic circuits, the reluctance of which depends on the degree of proximity of a workpiece so as to variably couple a current source to circuits for actuating the valves.

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**3,654,738**

**METHOD OF AND APPARATUS FOR EFFECTING SUPERIOR SANDING**

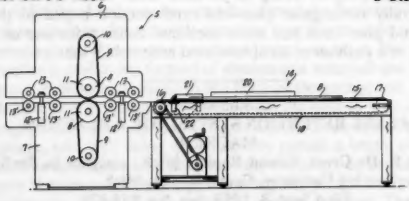
**Lambert S. Sternal, Wayzata, Minn., assignor to Timesavers Sanders, Inc., Minneapolis, Minn.**

**Continuation-in-part of Ser. No. 860,860, Sept. 25, 1969, abandoned**

**Filed Sept. 11, 1970, Ser. No. 71,546**

**Int. Cl. B24b** *21/00*

**U.S. Cl. 51—139** **8 Claims**



A sanding machine with complementary upper and lower sanding heads which have fast moving abrasive belts trained about and constantly shifted edgewise along superimposed contact drums between which the work is fed in a manner whereby the parallel narrow zones of work performing engagement of the abrasive belts with the opposite sides of the work extend at an oblique angle of not more than 75° to the lengthwise dimension of the work.

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**3,654,739**

**BELT GRINDING OR POLISHING MACHINE**

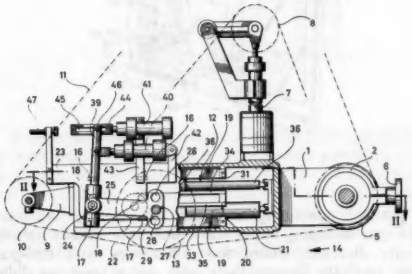
**Franz Stoy, Grafenberg, and Heinz Eder, Nurtingen, both of Germany, assignors to Metabowerke KG, Closs, Rauch & Schnizler, Nurtingen, Wurttemberg, Germany**

**Filed Feb. 5, 1970, Ser. No. 8,768**

**Claims priority, application Germany, Feb. 12, 1969, P 19 07 060.1**

**Int. Cl. B24b** *5/00, 24/00*

**U.S. Cl. 51—141** **14 Claims**



A belt grinding or polishing machine wherein the abrasive belt is trained over several pulleys so that it includes an elongated stretch which extends between two pulleys and the outer side of which removes material from travelling workpieces. A pressure applying wheel engages the inner side of the stretch and is movable in and counter to the direction of travel of the belt as well as at right angles to the stretch to thus enable the belt to remove material from flat or more complicated surfaces.

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**3,654,740**

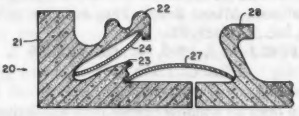
**INSULATING CONSTRUCTION BLOCK**

**Howard S. Morton, 2637 N.E. 37th Street, Fort Lauderdale, Fla.**

**Filed Oct. 22, 1969, Ser. No. 868,442**

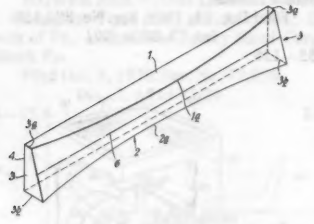
**Int. Cl. E04b** *2/32;* **E04c** *1/12*

**U.S. Cl. 52—222** **4 Claims**



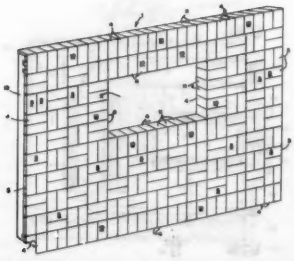

A construction block having protruding flanged arms positioned on one side shaped so as to hold flexible radiant energy reflectors. The block arms are angled so that the radiant energy reflectors overlap. A corner block provides for the proper mating with either half of the normal construction block.

3,654,741
**MANUFACTURE OF STRUCTURAL MEMBERS AND COMPONENTS**
Murray MacDonell, Woking, England, assignor to Montague L. Meyer Limited, London, England
Filed Mar. 24, 1970, Ser. No. 22,360
Claims priority, application Great Britain, Mar. 27, 1969, 16,093/69
Int. Cl. E04d 3/36, 3/42
U.S. Cl. 52—720 13 Claims



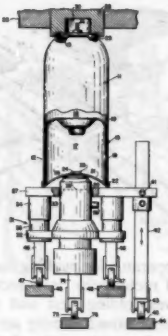
An identical pair of bar-like structural components of novel shape may be produced from a straight length of timber of rectangular cross section by severing it lengthwise. The length of material may be mounted on a carriage arranged to feed the material axially forward in a straight line past a band saw, such carriage being capable of rocking about the axis which passes through the geometric center of the cross-section of the material, and so rocking he length relative to the saw blade about such axis that the saw divides the top and bottom surfaces into the two components, having complementary opposed convex and concave edges. The two resulting components are then secured together as by gluing to produce a composite beam the strength of which is greatly in excess of the strength of the original unsevered length of timber. Composite beams may be produced by assembling four identical components in pairs back to back. Components of similar shape may be formed in other materials by moulding so as to possess comparable strength characteristics, according to the nature of the material. A panel may be stiffened by securing to its under side a number of components so formed.

3,654,742
**METHOD OF FORMING A CONCRETE BUILDING COMPONENT**
John A. Wilnau, 364 Rosewood, Eugene, Oreg.
Filed Jan. 26, 1970, Ser. No. 5,696
Int. Cl. E04b 1/04, 1/16
U.S. Cl. 52—744 6 Claims



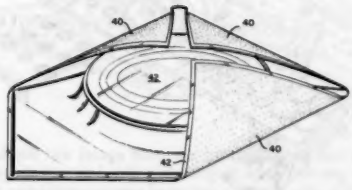
A building component composed of concrete blocks and a concrete slab with the blocks being recessed along their frontal surfaces for placement within a jig. The concrete receiving surfaces of the blocks are irregular for embedment within the poured concrete. The blocks are in contiguous, surface contact to retain and confine the concrete poured thereon. A method for the face down construction is disclosed.

3,654,743
**CONTAINER FILLING**
George Jerome McGeary, Bronx, N.Y., assignor to Colgate-Palmolive Company, New York, N.Y.
Continuation of application Ser. No. 861,224, Sept. 17, 1969, now abandoned, which is a continuation of application Ser. No. 627,334, Mar. 31, 1967, now abandoned. This application June 19, 1970, Ser. No. 48,926
Int. Cl. B65b 7/16, 31/02
U.S. Cl. 53—88 7 Claims



Aerosol containers of the internal piston type have gas under pressure introduced thereinto at one side of the piston through the bottom wall of the container. This is done by advancing a gassing head into sealing engagement with the container bottom while automatically opening a passage through the head and the container bottom for discharge of the gas under pressure into the container and then sequentially automatically closing the passage at the bottom wall of the container. The container bottom wall may contain either a normally open valving structure that is automatically closed by a cam actuated impact mechanism after filling, or a normally closed valve that is opened when the gassing head moves against the container bottom wall and automatically closed by gas pressure within the container.

3,654,744
**FLEXIBLE SKIN PACKAGE**
Harry A. Smith, Ballfall Road, Middletown, Conn.
Continuation-in-part of application Ser. No. 816,306, Apr. 15, 1969, now abandoned. This application Dec. 30, 1969, Ser. No. 889,356
Int. Cl. B65d 73/00, 81/14, 85/58
U.S. Cl. 53—22 4 Claims




A moisture and oil impervious package formed by a type of skin packaging technique. The present invention is charac-

terized by elimination of the paper board backing sheet of the prior art and employs a plastic drape sheet and a high density ionic copolymer base sheet.

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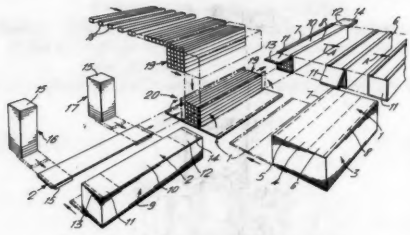
**3,654,745**

## METHOD OF AND APPARATUS FOR PACKING ARTICLES

**Michael John Smith, and William Charles Lane, both of Maidstone, Kent, England, assignors to Reed Paper Group Limited, London, England**

**Filed Apr. 3, 1969, Ser. No. 813,089**
**Claims priority, application Great Britain, Apr. 10, 1968, 17,372/68**
**Int. Cl. B65b** *35/50*
**U.S. Cl. 53—26** **21 Claims**



A method and apparatus for packing collated assemblies of elongate articles of rectangular cross-section in tubular cartons, which involves folding first and second rectangular cardboard blanks about the assembly so that the first blank forms three of the four side walls of the carton and the second blank defines the fourth side wall and end walls. Each blank is provided with connecting flaps outside of its three wall-forming panels, the connecting flaps of the first blank being secured to the outside of the side wall provided by the second blank, and those of the second blank being tucked into the open ends of the carton when such ends are closed by the end walls. The apparatus includes mechanisms for collating the articles into successive assemblies, delivering the assemblies and the respective blanks to a combining station, folding the blanks about the articles, and securing the connecting flaps to form a closed pack.

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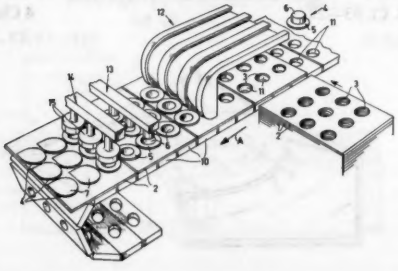
**3,654,746**

## METHOD OF MAKING COMPOSITE PACKAGES

**Hans Beckers, Viersen, Germany, assignor to Hamac-Hansella GmbH, Viersen, Germany**

**Original application Mar. 10, 1969, Ser. No. 805,763, now abandoned. Divided and this application June 19, 1970, Ser. No. 47,806**
**Claims priority, application Germany, Mar. 27, 1968, P 17 61 046.7**
**Int. Cl. B65b** *3/04, 7/28*
**U.S. Cl. 53—37** **5 Claims**



A method of making composite packages. A support of sheet material is provided with a plurality of apertures. Each aperture has lodged therein a receptacle provided with an opening. A cover overlies each opening. Either the cover or the associated receptacle is provided with a radially extending continuous or discontinuous flange which extends outwardly beyond the opening in which the receptacle is located. The cover is bonded to the receptacle and the flange is bonded to the support.

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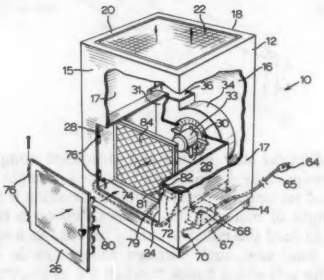
**3,654,747**

## ELECTRICAL PRECIPITATOR

**Cassius D. Remick, Waterloo, Ontario, Canada, assignor to Electrohome Limited**

**Filed Dec. 11, 1969, Ser. No. 884,150**
**Int. Cl. B03c** *3/01*
**U.S. Cl. 55—126** **3 Claims**



An electrical precipitator in the shape of a cabinet of which the door supports the electrodes on its inside face. One electrode consists of a wire wound back-and-forth between projecting resilient fingers of insulative material, while the other electrode is made up of conductive plates interposed between the adjacent reaches of the wire. All the plates are in electrical communication with one another. The door closure includes a switch controlling the energization of the electrodes such that the circuit is broken immediately the door-opening procedure is initiated, and the door-opening procedure requires a number of seconds to complete, sufficient to permit the electrodes to discharge completely before the door can be swung open.

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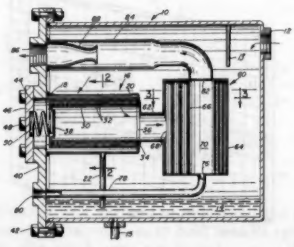
**3,654,748**

## MULTISTAGE LIQUID AND GAS SEPARATOR

**Carl Bloom, Springfield, Mass., assignor to Worthington Corporation, Holyoke, Mass.**

**Filed Feb. 26, 1970, Ser. No. 14,306**
**Int. Cl. B01d** *45/12*
**U.S. Cl. 55—322** **12 Claims**



A liquid and gas separator having a primary stage including an agglomerator cartridge and a secondary stage providing

the discharge path for the gas and liquid mixture passing from the primary stage. The secondary stage includes a chamber in which a baffle formed by a plurality of convolutions guides the gas and agglomerated liquid in a spiral path to centrifuge the liquid. The centrifuged liquid is thrown against the baffle and chamber walls and drains to a scavenging port while the liquid-free gas is discharged through a separate port.

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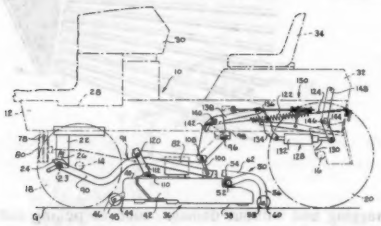
**3,654,749**

## MOWER MOUNTING LINKAGE

**William F. Ostergren, Terre Hill, and Joseph C. Hurlburt, Leola, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.**

**Filed Oct. 5, 1970, Ser. No. 77,954**
**Int. Cl. A01d** *35/26*
**U.S. Cl. 56—15.8** **14 Claims**



A linkage arrangement for mounting a rotary mower unit beneath the chassis of a tractor, between the front and rear wheels. The linkage arrangement includes draft and lift linkages, the draft linkage principally functioning to tow the mower unit while the lift linkage functions to move and guide the mower unit upwardly and downwardly, normally in a plane approximately parallel to the chassis.

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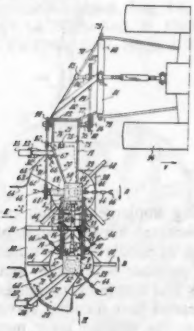
**3,654,750**

## MOWING MACHINES

**Cornelius van der Lely, 7 Bruschenrain, Zug, Switzerland**

**Original application Mar. 17, 1966, Ser. No. 535,199, now Patent No. 3,501,901. Divided and this application Jan. 16, 1970, Ser. No. 3,275**
**Int. Cl. A01d** *35/26*
**U.S. Cl. 56—16.2** **7 Claims**



A mowing machine has a frame laterally mounted of a prime mover, a first part of the frame has coupling members for connection to a three point lifting device, and a further frame part has mowing members rotatably mounted on vertical shafts which are supported above and below the mowing members. The further frame part has pivotally connected lower plates with bearings that support mowing members above the plates. The further frame part has frame portions articulated to one another so that the mowing members can follow ground undulations independantly.

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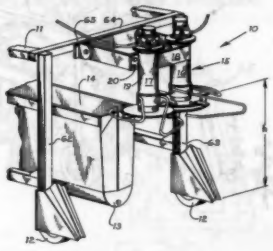
**3,654,751**

## CUTTING APPARATUS FOR CORN DETASSELING AND SOYBEAN HARVESTING

**James L. Meharry, Wingate, Ind., assignor to Societe Nationale Des Petroles D'Aquitaine, Paris, France**

**Filed Feb. 12, 1971, Ser. No. 114,841**
**Int. Cl. A01d** *45/02*
**U.S. Cl. 56—56** **10 Claims**



A cutting apparatus for use in detasseling stalks of corn and in harvesting soybeans. A cutter is mounted to a corn harvester or soybean combine and has a first disk slidingly contacting a pair of disks spaced apart. The first disk is rotatably mounted to a first tube and is rotatably driven. The pair of disks are mounted to a second tube parallel with and spaced apart from the first tube by a cross member. The pair of disks are rotatably driven at a speed and direction different from that of the first disk. Each disk has serrated edges. Gathering fingers are radially mounted to the disks and arms project outwardly from the tubes forming a funnel.

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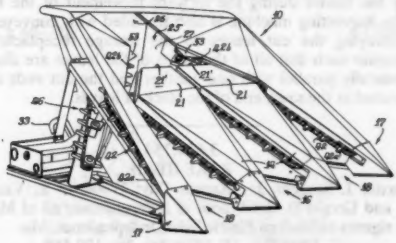
**3,654,752**

## MULTIPLE ROW FORAGE HARVESTER

**John D. Segredo, Chicago, Ill., assignor to International Harvester Company, Chicago, Ill.**

**Filed Feb. 18, 1970, Ser. No. 12,213**
**Int. Cl. A01d** *45/02*
**U.S. Cl. 56—98** **15 Claims**



A multiple row forage harvester having at least one center gathering divider and side gathering dividers forming a plurality of gathering passages including a pair of side gathering passages, with gathering chains on opposite sides of each gathering passage, the side gathering passages having rear portions inclined laterally inwardly toward each other, the gathering chains on the outer sides of the side gathering

passages following the direction of those passages and being made up of a plurality of corresponding sections, including a forward one at an angle closer to the foreward direction of travel and a rearward one at a greater angle thereto.

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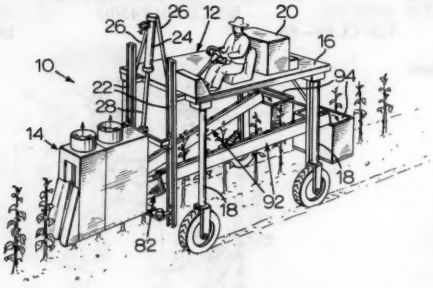
**3,654,753**
**TOBACCO HARVESTING MACHINE**
**Adrien C. Gervais, Barrie Hill Farms R.R. No. 2, Barrie, Ontario, Canada**
**Filed Nov. 30, 1970, Ser. No. 93,559**
**Int. Cl. A01d** *45/16*
**U.S. Cl. 56—27.5** **18 Claims**




A tobacco harvesting machine for cutting tobacco leaves from the stalk of the tobacco plant. The machine has a self-propelled frame which is formed with the passage through which the plants pass as the frame moves along a row of plants. The machine provides an upward draft of air about the plant as it enters the passage in the frame so that the tobacco leaves are all lifted upwardly by the air draft to be disposed parallel to the stalk of the plant. The leaves are clamped against the stalk when in this upwardly directed position by means of conveyers which are mounted on the frame and located on opposite sides of the passageway. An assembly of cutter blades are mounted in the frame so as to provide at least three upstanding cutting edges which are operable in response to movement of the tobacco plant through the passage to provide cutting actions disposed in planes which are spaced about 120° relative to one another so that as the frame moves relative to the stalk of a plant, any stems which are located within the path of any of the cutter blades will be cut. The cutter blades are mounted so as to pivot relative to their mounting in the event that the cutting edges strike a member, such as a sucker, which cannot be cut by the blades during the forward movement of the frame. The harvesting machine is also provided with conveyers for conveying the cut leaves to the storage receptacle in a manner such that all of the stems of the leaves are disposed generally parallel with one another and the cut ends are all located at the same end of the stack of leaves.

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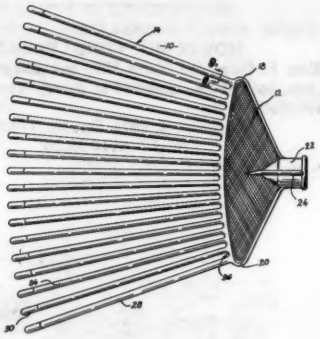
**3,654,754**
**RAKE HEAD**
**Baxter I. Scoggin, Jr., Kansas City; Woodrow E. Vaughan, and Gerald D. Reed, both of Independence, all of Mo., assignors to Modern Plastic Sales, Independence, Mo.**
**Filed Dec. 21, 1970, Ser. No. 100,199**
**Int. Cl. A01d** *7/00*
**U.S. Cl. 56—400.17** **12 Claims**

A multipurpose hand rake designed for rug and carpet rejuvenation, as well as lawn and garden use, has a virtually indestructible head molded from a thermoplastic resin and including a plurality of equally spaced, flexible teeth or tines extending in fan-shaped relation from a convex edge of a base plate to which a handle is removably attached. The teeth are provided with elongated, entirely unconfined shanks that are highly vibratory in all directions and include angularly offset, pulsating fingers having flat, terminal ends which provide a trip-hammer action for beating into matted floor coverings to loosen dirt and raise the nap, all without



snagging and without damage, such as pulling out bonded tufts. The fingers also penetrate deeply into heavy turf and thick, dense mats to loosen and easily remove leaves, grass cuttings, thatch and other debris without damage to live, decorative growth.

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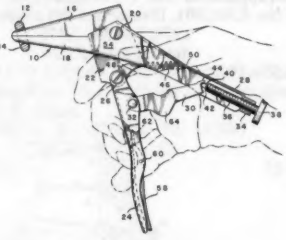
**3,654,755**
**ROPE SPLICING IMPLEMENT**
**Clarence R. Bell, c/o KM Cafe, Grays River, Wash.**
**Filed July 28, 1970, Ser. No. 58,841**
**Int. Cl. B65h** *69/06;* **B25b** *7/12*
**U.S. Cl. 57—23** **11 Claims**



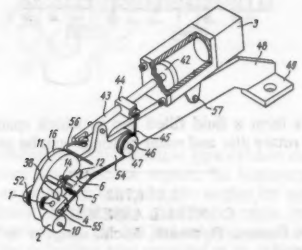
A rope splicing implement which permits pointed jaw members to be inserted between adjacent strands of a rope and opened when its handle members are squeezed together. A locking lever member is pivotally secured to one of the handle members and cammingly engages the other handle member. A threaded bolt member serves as an adjustable stop member for the locking lever member whereby the amount of opening of the jaw members may be varied. A tension spring member coupled with an over-toggle action of the locking lever permits the implement to be locked in its open position whereby both hands of the user are free to effect the rope splicing or laminating. Thereafter, a release lever may be actuated with one hand to close the jaw members.

3,654,756

## APPLIANCE FOR AUTOMATIC THREAD PIECING IN SPINNING OR SPINNING AND TWISTING MACHINES

Nadezhda Ivanovna Artamonova, ulitsa Sovetskaya, 27, kv. 14, Barnaul; Leonid Mikhailovich Bushin, ulitsa Gagarina, 6, kv. 9, Novoaltaisk; Leonid Nikolaevich Besedin, ulitsa Internatsionalnaya, 46, kv. 31, Barnaul; Anna Timofeevna Zhurenko, ulitsa Krupskoi, 82, kv. 7, Pavlodar; Leonid Mikhailovich Urvantsev, prospekt Komsomolsky, 50, kv. 3, Barnaul; Jury Dmitrievich Scherbakov, ulitsa Internatsionalnaya, 4a, kv. 5, Barnaul; Boris Ivanovich Yasjukevich, prospekt Lenina, 8, kv. 37, Barnaul; Anatoly Anisimovich Demin, ulitsa Nekrasova, 10, Novoaltaisk, and Evgeny Viktorovich Peshkov, ulitsa Chkalova, 50d, kv. 4, Barnaul, all of U.S.S.R.

Filed Feb. 6, 1969, Ser. No. 796,969
Claims priority, application U.S.S.R., May 17, 1967, 1077606
Int. Cl. D01h *15/00*
U.S. Cl. 57—34 R 5 Claims



A device for piecing broken ends in spinning and twisting machines in which a piecing roller cooperates with a catching mechanism. The catching mechanism includes a pair of plates movable relative to one another and forming a V-shaped slot for pinching a broken thread end. The plates are located in a first plane and are supported on a common pivotal connection for rotation in a second plate transverse to the first plane upon breaking of the thread.

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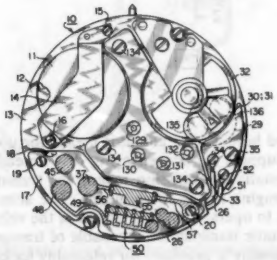
3,654,757

## AMPLITUDE ADJUSTER IN AN ELECTRONIC TIMEPIECE

Hirotoki Takamune, Tokyo, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Aug. 18, 1970, Ser. No. 64,716
Claims priority, application Japan, Aug. 18, 1969, 44/78261; Aug. 20, 1969, 44/78555; Aug. 25, 1969, 44/80599
Int. Cl. G04c *3/00*; H03b *3/02*
U.S. Cl. 58—23 A 8 Claims



The mechanical vibrator of an electronic timepiece is provided with a transistorized drive circuit having a driving coil and a sensing coil. A vibration amplitude adjusting resistor unit is provided in the circuit and is comprised of a series of resistor elements and conductive elements arranged originally with a predetermined number of connectors which may be readily interrupted and/or a predetermined number of connectors having non-conductive gaps which may readily be closed to select the desired resistance to increase or decrease the amplitude of vibration.

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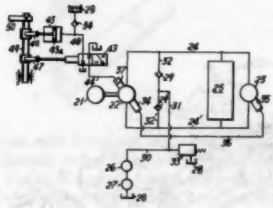
3,654,758

## INTERNAL COMBUSTION ENGINE STARTING SYSTEM IN A HYDRAULIC POWER TRANSMISSION SYSTEM

Ryozo Aoyama, Yokohama-shi; Akira Koiwai, Tokyo, and Kenji Yamada, Kawasaki-shi,, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho (Komatsu Ltd.), Tokyo

Filed Dec. 1, 1969, Ser. No. 881,161
Claims priority, application Japan, Dec. 4, 1968, 43/88310; Dec. 28, 1968, 43/96075 Int. Cl. F02n *7/00*
Int. Cl. F02n *7/00*
U.S. Cl. 60—19 4 Claims



A hydraulic power transmission system comprising an internal combustion engine, at least a variable displacement axial plunger pump having a swash plate, and at least an axial plunger motor, is further provided with a starting pump, which is adapted to be operated directly manually, indirectly manually or by a load, for starting the internal combustion engine, when it does not properly start, in such a manner that the swash plate of the variable displacement axial plunger pump is hydraulically brought out of the neutral position by the action of the starting pump and then the internal combustion engine is driven by the load.

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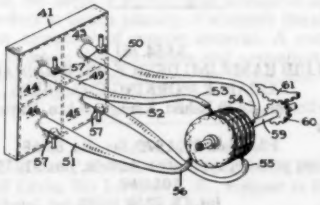
3,654,759

## APPARATUS FOR CONVERTING SOLAR ENERGY TO LOW COST POWER

Charles G. Abbot, 4409 Beechwood Road, Hyattsville, Md.

Filed July 28, 1970, Ser. No. 58,838
Int. Cl. F03q *7/02*
U.S. Cl. 60—26 6 Claims



Solar energy is converted to useful energy by dividing a reflected solar beam into a plurality of concentrated cones of

solar radiation. Each cone passes into a black box to heat air therein. The heated air is then converted to mechanical energy by suitable apparatus and the mechanical motion may in turn be converted to electrical energy. In simpler, but less efficient embodiments, said cones may be converted by thermoelectric means directly into electric currents.

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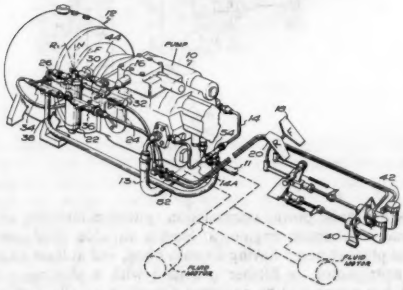
**3,654,760**
**CONTROL DEVICE FOR A HYDROSTATIC TRANSMISSION AND A HYDROSTATIC TRANSMISSION EMBODYING SUCH A DEVICE**

**Sydney Bennett, Batley, England, assignor to Joshua Shaw & Sons Limited, Batley, England**

**Filed Dec. 22, 1969, Ser. No. 887,142**
**Claims priority, application Great Britain, Jan. 3, 1969, 509/69**
**Int. Cl. F15b** *7/00*
**U.S. Cl. 60—52 VS** **4 Claims**



In a hydrostatic transmission having a variable volume swash plate pump, a control device which automatically overrides the ratio setting controls of the transmission and reduces the swash plate angle in the event that there is a sudden increase in load on the transmission to prevent damage to the prime mover driving the pump. This is achieved by mounting a cylinder for rocking movement on the pump and connecting the piston thereof to the swash plate angle adjusting mechanism so that alteration of the cylinder's angular position by the transmission controls adjusts the pump swash plate angle and pump output. The automatic override is achieved by hydraulically coupling the pump output to the cylinder so that the piston of such cylinder is displaced along its axis should the output pressure of the pump increase above a predetermined limit, and the displacement of the piston reduces the swash plate angle until the increase in load is removed.

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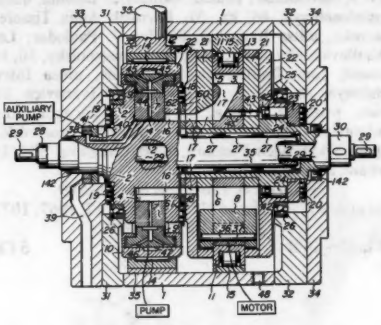
**3,654,761**
**FLUID HANDLING DEVICE WITH RADIALLY VARIABLE WORKING CHAMBERS**

**Karl Eickmann, 2420 Isshiki, Kanagawa-ken, Hayama-machi, Japan**

**Filed Jan. 29, 1970, Ser. No. 6,668**
**Claims priority, application Austria, Jan. 31, 1969, A 1014/69**
**Int. Cl. F15b** *15/18*
**U.S. Cl. 60—53 B** **12 Claims**

The two rotors of a fluid handling device, such as a pump-motor hydrostatic transmission, are positioned adjacent each other in axial direction by thrust bearings at the outer axial ends of the rotors so that the confronting inner end faces of




the rotors form a fluid filled gap in which spacing means, such as a rotary disc and roller bearings, can be provided.

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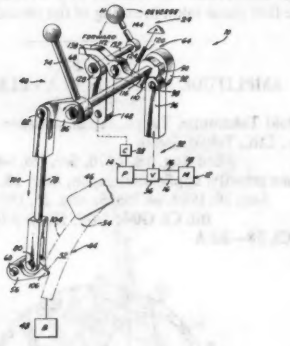
**3,654,762**
**CONTROL ASSEMBLY**

**Gerald D. Damon, Plymouth, Mich., assignor to Eaton Corporation**

**Original application Mar. 25, 1968, Ser. No. 715,655, now Patent No. 3,517,790, dated June 30, 1970. Divided and this application Apr. 16, 1970, Ser. No. 33,126**
**Int. Cl. F16d** *31/06*
**U.S. Cl. 60—53 R** **1 Claim**



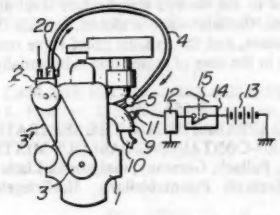
Disclosed herein is an actuator means for use in a vehicle having a support surface engaging drive means, an engine, and hydrostatic transmission means for transmitting power from the engine to the drive means. The actuator means is responsive to operation of the brakes of the vehicle to render the hydrostatic transmission incapable of transmitting power. A lock assembly is provided for releasably locking the actuator means in an operated condition. A lock release means operates the lock assembly to a release condition in response to operation of a control assembly for the hydrostatic transmission to a neutral condition.

3,654,763

## EXHAUST EMISSION PURIFYING DEVICE

Mikiji Ito, Nagoya; Kenji Yamada, Kariya, and Kazuo Noda, Aichi-ken, all of Japan, assignors to Nippondenso Kabushiki Kaisha, Aichi-ken, Japan

Filed Apr. 23, 1970, Ser. No. 31,247
Claims priority, application Japan, Sept. 12, 1969, 44/87516; July 16, 1969, 44/67707
Int. Cl. F01n 3/14
U.S. Cl. 60—294 11 Claims



Improvements in an air injection type exhaust emission purifying device for a gasoline engine, the improvements consisting of an air pump driven by the engine for supplying air to the exhaust port of each cylinder to cause an oxidizing reaction between the air and hot exhaust gases, and at least one sparking or heating plug provided in an exhaust manifold to fire and burn a good mixture of air and highly dense unburned hydrocarbon resulting from the misfiring caused during the deceleration of the engine, thereby preventing the occurrence of afterburn noises and minimizing the quantity of air required and accordingly reducing the capacity of the air pump and power consumption of the engine.

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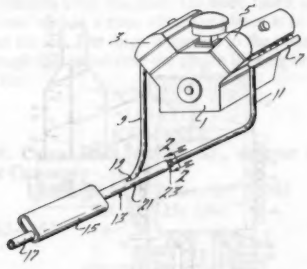
3,654,764

## PLURAL DIAMETER TUBE

Franklin R. Hubbell, III, Brooklyn, Mich., assignor to Tenneco Inc., Racine, Wis.

Filed May 18, 1970, Ser. No. 38,021
Int. Cl. F01n 7/08; F16l 7/00
U.S. Cl. 60—324 1 Claim



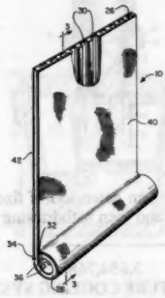
A double diameter pipe or tube section suitable for use in a motor vehicle exhaust system comprises a large size thin-walled metal pipe that has folds formed in it which extend radially inside the pipe and serve as a means to reduce the cross sectional size of the pipe end and enable it to be connected to a small diameter pipe in the system.

3,654,765

## SUBTERRANEAN WALL DRAIN

Kent A. Healy, Chaffeeville Road, R.R. 3, and Richard P. Long, 63 Northwood Apts., both of Storrs, Conn., assignors to Research Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 812,982, Apr. 3, 1969, now Patent No. 3,563,038. This application Feb. 10, 1971, Ser. No. 114,183
Int. Cl. E02b 11/00; E02d 31/02; B01d 35/02
U.S. Cl. 61—11 6 Claims



A subterranean wall drain unit including a drain pipe having openings therein and a longitudinally extending planar core defining channels normal to the pipe. Water pervious sheet material covering one face of the core and the openings in the pipe to form a filter therefor. The other face of core may be covered with a plastic sheet or other vapor barrier.

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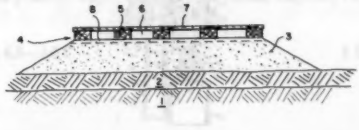
3,654,766

## DRILLING

Frank J. Schuh, Dallas, Tex., assignor to Atlantic Richfield Company, New York, N.Y.

Original application Dec. 22, 1969, Ser. No. 887,207, now Patent No. 3,602,323, dated Aug. 31, 1971. Divided and this application Feb. 22, 1971, Ser. No. 117,358
Int. Cl. E02d 27/36, 27/44
U.S. Cl. 61—50 5 Claims



A pad for drilling at least one borehole through the earth, the pad being composed of a first layer of particulate material adjacent the earth, a second layer composed of spaced apart members to form a plurality of channels therein, and a third layer composed of support material. A method for drilling a borehole through tundra and permafrost without substantially thawing same by using the above described pad for carrying out the drilling procedure.

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3,654,767

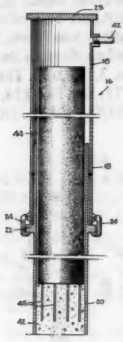
## METHOD OF FORMING A COMPOSITE PILE

Lewis Fred Cavin, San Lorenzo, Calif., assignor to Raymond International, Inc., New York, N.Y.

Filed May 8, 1970, Ser. No. 35,693
Int. Cl. E02d 5/34, 5/50
U.S. Cl. 61—53.64 9 Claims

This invention relates to a method of forming composite

piles by pouring in place the bottom portion of the pile in a



casing, thence installing an extension of fixed length on top of the bottom portion, and then withdrawing the casing.

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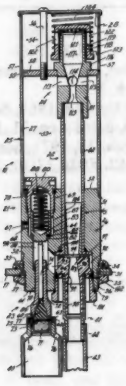
3,654,768

## VORTEX TUBE COOLING SYSTEM

Leslie R. Inglis, and Joseph E. Peter, both of Cincinnati, Ohio, assignors to Vortec Corporation, Cincinnati, Ohio

Filed June 16, 1970, Ser. No. 46,631
Int. Cl. F25b *9/02*
U.S. Cl. 62—5 22 Claims



A cooling system particularly adapted for sealed and substantially sealed, and unsealed enclosures, the system making use of a vortex tube. The cold tube portion of the vortex tube is ducted into the enclosure and the hot tube portion of the vortex tube is ducted to the atmosphere. In preferred form, a high pressure air inlet valve is interconnected with the vortex tube's generator, the inlet valve being controlled by a thermostat adapted to sense the temperature within the enclosure. An exhaust structure is provided to discharge enclosure air and hot tube air to the atmosphere, the exhaust structure being interconnected with the enclosure as well as with the hot tube. The exhaust structure admixes air exhausted from the enclosure and air exhausted from the hot tube prior to discharging the combined flows. The exhaust structure includes an aspirator for admixing the enclosure air and the hot tube air, and a single pressure relief type outlet valve for exhausting the admixed air to the atmosphere.

In operation, the thermostat senses the temperature inside the enclosure and causes the inlet valve to open when that temperature exceeds a predetermined level. The open inlet valve admits high pressure air to the vortex tube's generator where, through the well known action of the vortex tube, a cold air flow is developed in the cold tube toward the enclosure and a hot air flow is developed in the hot tube toward the exhaust structure. As the cold air flow is admitted into the enclosure, the air in the enclosure is driven out of the enclosure and at least part is piped to the exhaust structure where it is admixed with the hot air flow from the hot tube. Thereafter, the mixed flow of enclosure air exhaust and hot tube air exhaust are discharged to the atmosphere through the single relief type outlet valve. When the inside of the enclosure is cooled to the desired temperature level as sensed by the thermostat, the inlet valve is closed, cold air flow into the enclosure ceases, and the exhaust relief valve reseals the entire enclosure in the case of sealed and substantially sealed enclosures.

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3,654,769

## PROCESS AND APPARATUS FOR THE SEPARATION OF A HYDROGEN-CONTAINING GASEOUS MIXTURE

Hermann Linde, Pullach, Germany, assignor to Linde Aktiengesellschaft Zentrale Patentableilung, Hoellriegelskreuth, Germany

Filed Oct. 31, 1968, Ser. No. 772,283
Claims priority, application Germany, Nov. 3, 1967, P 16 67 594.8
Int. Cl. F25j *3/00, 3/08*
U.S. Cl. 62—23 13 Claims

A process and apparatus is provided for separation of a hydrogen-containing gaseous mixture, wherein the gaseous mixture is separated into a condensate fraction and a crude hydrogen fraction containing the hydrogen in addition to other residual components. Separation is accomplished by refrigeration under pressure in at least two reversible regenerators which are charged alternately with crude gas and scavenging gas. The crude hydrogen, after further cooling by partial condensation or by a washing step with liquid nitrogen, is freed of the residues of other components. The purified hydrogen product, which can optionally contain nitrogen, is engine-expanded for the purpose of producing refrigeration and then conducted through heat exchange coils in at least one of the regenerators.

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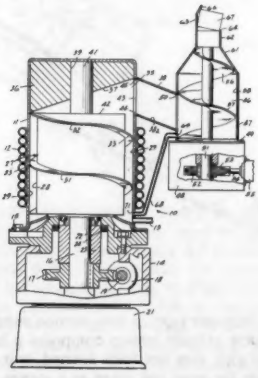
3,654,770

## ICE MAKER CONSTRUCTION

Jack F. Clearman, Stevensville, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Oct. 17, 1969, Ser. No. 867,149
Int. Cl. F25c *1/14*
U.S. Cl. 62—320 4 Claims



An ice maker of the type employing a refrigerated chamber and harvesting auger positioned with its flight in

scraping relation to an inner wall of the refrigerated chamber for continuously scraping ice particles from the wall thereof, and being provided with a vertical shaft for supporting the harvesting auger. Transfer means receive discharge from the harvesting auger and transfer the same under pressure developed by the harvesting auger into a separate compression chamber disposed adjacent to the refrigerated chamber. A helical compression auger rotatable within the compression chamber drives the ice product in the form of a confined columnar path through a restricting orifice to form a column of hard ice which may be broken into short lengths by any suitable means to obtain "ice cubes." A single common driving motor may be utilized to drive both augers or, if desired, separate gear means for the compression auger may be provided and driven by a separate motor unit or by a power take-off from a drive source utilized for the harvesting auger.

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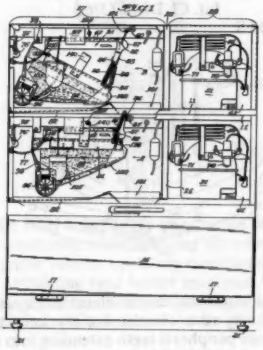
**3,654,771**
**CAM AND ICE MACHINE COMBINATION**
**Thomas L. Kuebler, 225 Illinois Avenue, Erie, Pa.**
**Filed Jan. 19, 1970, Ser. No. 3,620**
**Int. Cl. F25c** *1/08*
**U.S. Cl. 62—352** **5 Claims**



This specification discloses a machine for making ice cubes in an inverted tray having a closure platen and having an improved cam for forcing the platen open at the beginning of the harvest cycle. In its preferred form a double eccentric cam is used. Generally there is clearance or slack that must be taken up at the beginning of cam rotation before maximum force is required. The cam is so oriented relative to the follower that maximum force is developed by the cam at a point of rotation after the slack has been taken up between the parts and also at a time when the platen is to be broken loose from the ice. The force is applied to the platen continuously through the entire time the platen is being broken away from the ice.

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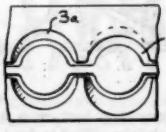
**3,654,772**
**ICE MAKER**
**Robert W. Curry, III, Louisville, Ky., assignor to General Electric Company**
**Filed Sept. 8, 1970, Ser. No. 70,082**
**Int. Cl. F25c** *1/06*
**U.S. Cl. 62—353** **10 Claims**




An ice maker of the type comprising a mold including a plurality of cavities interconnected by fluid passages and ejecting means for ejecting ice pieces from the mold. In order to separate the ice pieces, the ejection axes of adjacent cavities slant relative to one another so that the connecting ice webs formed in the passages are broken during ejection of the ice pieces.

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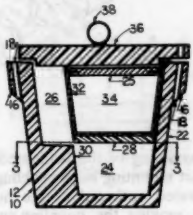
**3,654,773**
**CONTROLLED TEMPERATURE BAIT BUCKET**
**John D. White, 923 Valley Ridge Drive, Birmingham, Ala.**
**Filed Aug. 31, 1970, Ser. No. 68,408**
**Int. Cl. F25d** *3/08*
**U.S. Cl. 62—371** **7 Claims**




A controlled temperature bait bucket which includes, generally a small inner container with an insulated bottom and heat conducting sides within a large outer insulated bucket. The bucket is divided into two compartments by the container. The bait which is to be maintained at a controlled temperature is placed within the container, and the two compartments of the bucket are filled with a cooling agent. Fixed heat transfer means between the upper compartment and the container achieve initial cooling to optimum bait survival temperature and a manually controlled variable heat transfer means provides variable rate of heat transfer between the lower compartment and the container to maintain this temperature.

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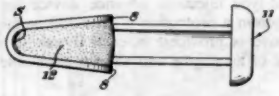
**3,654,774**
**EAR-ORNAMENT CLIPS**
**Johannes Antonius Wilhelmus Petrus Van Bergen, 109 Westward Deals, Kedington, Suffolk, England**
**Filed Aug. 7, 1969, Ser. No. 848,250**
**Claims priority, application Great Britain, Aug. 24, 1968, 40,554/68**
**Int. Cl. A44b** *21/00*
**U.S. Cl. 63—14 C** **1 Claim**



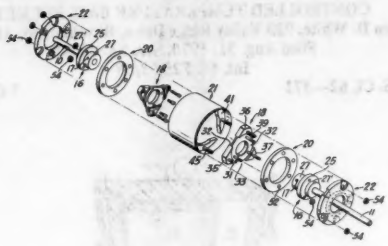

A precious metal ear-ornament clip whose "grip" on the ear lobe is adjustable and is maintained by maintenance of the angular relationship of its two constituent clip members. Said maintenance is ensured by the frictional engagement of the inwardly directed surfaces of two limbs (which form a part of one clip member and whose free ends are pivotally connected to the other clip member) with the outwardly directed surfaces of two further limbs (carried by the other clip member) which are forced apart by a spring located between them. The spring is essential because the precious metal or precious metal(s) alloys may lack the requisite spring properties.

3,654,775

## DISC TYPE FLEXIBLE SHAFT COUPLING

Charles H. Williams, Export, Pa., assignor to Koppers Company, Inc.

Filed Mar. 16, 1970, Ser. No. 19,803
Int. Cl. F16d 3/78
U.S. Cl. 64—13 16 Claims



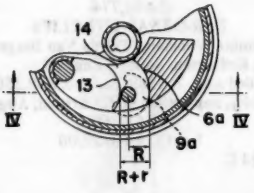
A flexible shaft coupling of the laminated disc-pack type having multi-element mounting hubs enabling the disc-packs to be axially separated outboard of the hubs and yet be removable without moving the coupling-connected shafts. The coupling includes a hub for each shaft, a triangular adapter connected to each hub and its respective disc-pack, a sleeve axially connecting the disc-packs and arranged to cover both the disc-packs and adapters and preferably a shroud at each end of the sleeve to close the coupling.

3,654,776

## CENTRIFUGAL-TYPE INJECTION TIMING ADJUSTING DEVICE FOR INTERNAL COMBUSTION ENGINES

Tomoyasu Jingu, and Tokio Yamamoto, both of Higashi-Matsuyama, Japan, assignors to Diesel Kiki Kabushiki Kaisha, Skibuya-ku, Tokyo, Japan

Filed June 11, 1970, Ser. No. 45,494
Int. Cl. F16d 5/00
U.S. Cl. 64—25 9 Claims




A centrifugal-type injection advance device for internal combustion wherein a protrusion is provided on each flange pin and a groove is provided in each flyweight to reduce operating noise of an engine and to assure a stable in function.

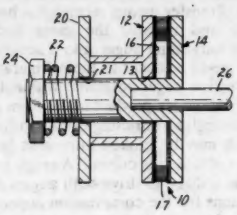
3,654,777

## TORQUE TRANSMITTING DEVICE

Roger V. Grundman, Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 25, 1970, Ser. No. 92,761
Int. Cl. F16d 7/02
U.S. Cl. 64—30 23 Claims

A torque transmitting device in which a plurality of fibers extend perpendicularly from one of a pair of normally opposed, generally parallel surfaces to engage circumferentially spaced protuberances defining the other surface. The torque transmitting surfaces are defined on a pair of relatively rotatable members and the extent of fiber engagement is adjustable to permit adjustment of the torque transmitted between the members by engagement of the fibers with the protuberances upon relative rotation of the members.

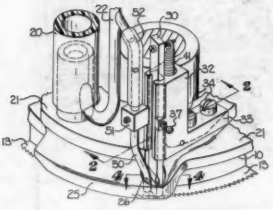


3,654,778

## YARN CUTTER FOR HOSIERY KNITTING MACHINES

Clarence W. Minton, Nashville, Tenn., assignor to Americal Corporation, Henderson, N.C.

Filed Dec. 4, 1970, Ser. No. 95,267
Int. Cl. D04b 15/61
U.S. Cl. 66—145 S 9 Claims



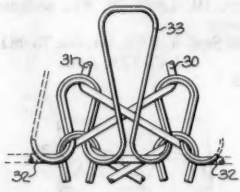
An improved stationary cutter element for use with the rotating cutter ring of a circular hosiery knitting machine having contiguous peripheral teeth extending into close proximity to the rotating circle of needles. The cutting edge of the stationary cutter element is properly shaped to be cammed upwardly as it engages the radially extending leading edges of successive teeth to provide a scissors action therewith and effectively cut any yarn engaged thereby.

3,654,779

## PANTY TYPE GARMENT AND METHOD OF KNITTING THE SAME ON A FLAT KNITTING MACHINE

Juan Rovira Fors, Pinar 20, bis Canet de Mar, Barcelona, Spain

Filed Apr. 13, 1970, Ser. No. 27,729
Claims priority, application Spain, Apr. 23, 1969, 366360
Int. Cl. A41b 9/02
U.S. Cl. 66—171 6 Claims



The panty type garment is knit on a full-fashioned type knitting machine which is modified to feed warp yarns to the needles to form warp knit fabric with weft knit yarn and terry

loop yarn in selected portions thereof. The modification of the machine includes the addition of separate sets of front and rear yarn guides with means for imparting both swinging and shogging movements thereto.

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**3,654,780**

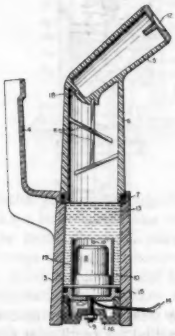
**CLOTHES STEAMER DEVICE**

**Bernard Frank, Shamokin, Pa., assignor to Dart Industries, Inc., West Bend, Wis.**

**Continuation of application Ser. No. 817,932, Apr. 21, 1969, now abandoned. This application Apr. 21, 1971, Ser. No. 136,220**

**Int. Cl. D06c *1/00*; D06f *75/00***

**U.S. Cl. 68—222** **5 Claims**



A portable hand held clothes steamer has structure therein to prevent sputtering and dispensing of water droplets with the steam under various operating conditions. The structure includes a circulating type heater immersed in water, a circuitous passageway to a steam dispensing head and structure adapted to separate condensed water droplets from live steam.

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**3,654,781**

**APPARATUS FOR THE CONTINUOUS EXTRACTION OF WATER FROM FLAT MATERIAL**

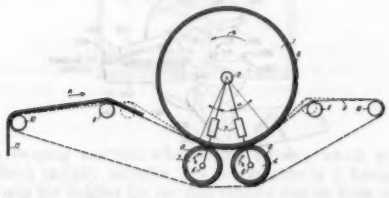
**Bohuslav Plechac, Otrokovice, Czechoslovakia, assignor to Statni vyzhumny ustav kozedelny, Gottwaldov, Czechoslovakia**

**Filed Apr. 3, 1970, Ser. No. 25,415**

**Claims priority, application Czechoslovakia, Apr. 17, 1969, PV 2727-69**

**Int. Cl. C14b *1/08***

**U.S. Cl. 69—41** **7 Claims**



Apparatus for the continuous extraction of water from flat material such as leather comprising a drum and at least one counter pressure roller contiguous therewith. A permeable belt is arranged to run between the rollers to carry the material in contact with the surface of the drum. The rollers are angularly positionable about the periphery of the drum, and the belt is adjustable in its envelopment of the drum.

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**3,654,782**

**MAGNETIC LOCK**

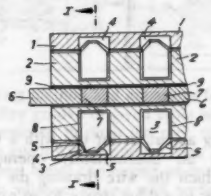
**Georg Heimann, Wendelinusstrasse 61, 5171 Stetternich, Germany**

**Filed July 26, 1968, Ser. No. 748,029**

**Claims priority, application Germany, Aug., 1967, H 59763**

**Int. Cl. E05b *47/00***

**U.S. Cl. 70—276** **34 Claims**



A magnetic lock wherein an actuating member is turnable or reciprocable to and from a starting position by means of a key which has magnetic inserts adapted to change the orientation of magnetic tumblers which are rotatable in the actuating member and normally assume positions in which they prevent movement of the actuating member from starting position. The actuating member is adjacent to and is locked by the tumblers to a base member when the key is removed. like poles of the tumblers are adjacent to each other when the key is applied so that such poles repel each other as soon as the key is removed and cause the tumblers to assume positions in which the actuating member is locked to the base member.

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**3,654,783**

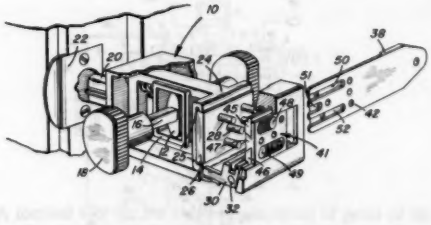
**LOCK WITH READILY INTERCHANGEABLE KEY**

**Fred G. Sinclair, 1330 N. E. 144th Street, North Miami, Fla.**

**Continuation-in-part of application Ser. No. 751,873, Aug., 1968, now Patent No. 3,505,841. This application Apr. 1, 1970, Ser. No. 24,594**

**Int. Cl. E05b *35/14***

**U.S. Cl. 70—349** **8 Claims**

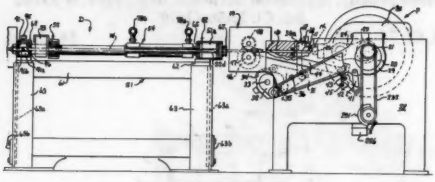


A key operated, permutation lock having a housing in which a pin plate support is slidably mounted and actuated by a lock bolt support. A back plate having openings to align with a pin plate support is positioned to be in registry with the pins when a proper key is inserted between the pin plate and the back plate. A stop lever prevents movement of the pin plate support until the lever is pushed aside by a properly fitting key.

## 3,654,784
## WIRE DRAWING AND FEEDING APPARATUS

Richard A. Alcock; Robert M. Guthrie, and Robert B. Johnston, all of Rockford, Ill., assignors to Fastener Engineers, Inc., Rockford, Ill.

Filed Dec. 15, 1969, Ser. No. 885,198
Int. Cl. B21d *55/00*; B21c *1/14*
U.S. Cl. 72—5 8 Claims

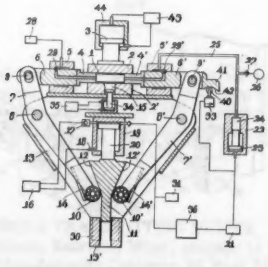


A wire drawing apparatus for use with a wire processing machine having an intermittently operated wire feed mechanism in which the wire drawing die is moved by a hydraulic actuator in a draw stroke to an extended position under the control of the wire processing machine, and the drawing die remains in the extended position until it is subsequently advanced with the wire by the feed mechanism of the processing machine so that the work stroke of the hydraulic actuator is automatically changed in accordance with the length of the wire advanced by the processing machine feed mechanism, and the cycling of the wire drawing apparatus is automatically varied in accordance with the cycle of the processing machine. Apparatus is also provided on the wire drawing machine for assisting the feed mechanism of the wire processing machine to advance the draw die and wire.

## 3,654,785
## LIQUID PRESSURE BULGE FORMING APPARATUS

Terumori Ueda, Nagoya, and Tunemichi Imai, Aichi-ken, both of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Jan. 27, 1970, Ser. No. 6,258
Claims priority, application Japan, Jan. 29, 1969, 44/6516
Int. Cl. B21d *15/10*
U.S. Cl. 72—28 4 Claims

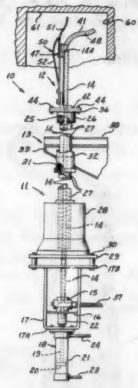


A pipe to be formed is placed into a die having a cavity corresponding to the form desired. High pressure liquid is introduced into the pipe, while both ends thereof are compressed thus bulging the pipe, without heating it, in the die cavity to the form desired.

## 3,654,786
## METAL SURFACE TREATING APPARATUS FOR INTERNAL SURFACES

William J. Koenecke, Glen Rock, N.J., and Joel R. Lazar, New York, N.Y., assignors to Metal Improvement Company, Inc.

Filed Sept. 15, 1970, Ser. No. 72,391
Int. Cl. C21d *7/06*
U.S. Cl. 72—53 10 Claims

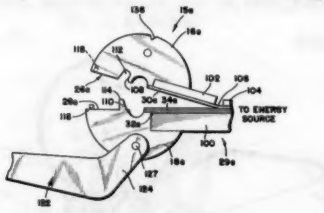


The metal surface treating apparatus comprises a tubular lance, which is supported for rectilinear movement and connected to receive pressurized fluid and solid particles and discharge the same from one end thereof, and a deflector mounted adjacent to the discharge end of the lance and for rotation about the lance to direct the discharging stream of fluid and particles. The deflector is constructed and arranged to coact with the lance, upon rectilinear movement of the lance relative to the deflector, to automatically alter the direction of the stream of fluid and particles between one extreme position where the stream discharges in a direction substantially normal to the longitudinal axis of the lance and another extreme position in which the stream is directed coincident with the longitudinal axis of the lance.

## 3,654,787
## ELECTROMAGNETIC FORMING APPARATUS

David F. Brower, San Diego, Calif., assignor to Gulf Oil Corporation, San Diego, Calif.

Filed Oct. 15, 1968, Ser. No. 767,777
Int. Cl. B21d *26/14*
U.S. Cl. 72—56 4 Claims

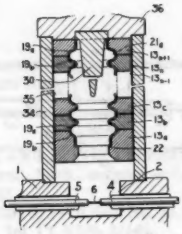



An electromagnetic forming apparatus utilizes a forming coil having separable die portions for receiving a workpiece which is configured in such a manner that it could not otherwise be worked by a high intensity magnetic field. An improved design of the forming coil increases its operating life.

## 3,654,788
## METHOD OF DISCHARGE FORMING BULGED ARTICLES

Tadao Kimura, Tokyo, Japan, assignor to Lead Metal Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 17, 1969, Ser. No. 877,393
Claims priority, application Japan, Nov. 20, 1968, 43/85365
Int. Cl. B21d 26/12
U.S. Cl. 72—56 3 Claims

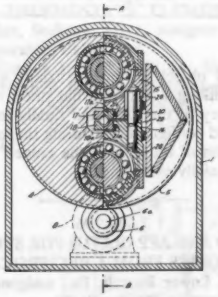


A method of discharge forming bulged articles comprising the steps of inserting a hollow tube-like metallic workpiece in an axially movable mold member, releasing an energy by high voltage discharge so that said movable mold member may be caused to move axially thereof toward a fixed mold member, and compressing said hollow tube-like workpiece axially thereof to cause a portion of the wall of the workpiece to expand outwardly whereby a tube-like article with a bulge can be produced.

## 3,654,789
## SWAGING MACHINE

Hans Brauer, Leichlingen, Germany, assignor to Th. Kieserling & Albrecht, Solingen, Germany

Filed Oct. 22, 1969, Ser. No. 868,320
Claims priority, application Germany, Oct. 24, 1968, P 18 04 781.9
Int. Cl. B21j 7/16, 13/04
U.S. Cl. 72—76 9 Claims

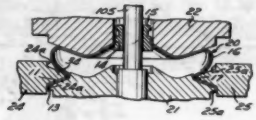


A swaging machine wherein the housing which accommodates radially movable dies is rotatable in a frame and wherein the holders for the dies receive motion from eccentric portions of shafts which are rotatable in the housing when the latter rotates in the frame. The shafts carry pinions meshing with a gear which is fixedly or rotatably mounted in the frame. The gear rotates the shafts and thereby reciprocates the dies in response to rotation of the housing in the frame.

## 3,654,790
## MEANS FOR MAKING PULLEYS

Lester T. Zatko, Gates Hills, Ohio, assignor to Philip L. Moskowitz, trustee

Continuation of application Ser. No. 687,695, Dec. 4, 1967, now abandoned. This application May 15, 1970, Ser. No. 37,855
Int. Cl. B21d 22/16
U.S. Cl. 72—82 23 Claims

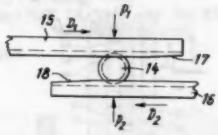


A pulley making method and apparatus for forming a pulley having a pulley groove of given cross section defined by flange walls connected through the root of the groove, the groove having a given root diameter, from a pulley blank in the form of a sheet metal cup having an annular bulge in the cup wall and an adjacent flaring wall portion, with a valley defined between the bulge and adjacent flaring wall portion. A pulley is formed from the blank by engaging the flaring wall portion and the side of the bulge remote from the valley with axially movable dies and moving the dies together to crush the bulge and form it into a double wall. Groove-forming rolls are positioned within the valley so that they extend radially inwardly to an imaginary circle having a diameter equal to the root diameter prior to the attainment of a final forming position by the axially movable dies. Relative rotation is established between the pulley blank and the group of rolls and the rolls roll within the valley to receive the axial thrust of the bulge as its crushing is completed, and to keep the valley clear as its shape approaches and conforms to the desired pulley groove cross section.

## 3,654,791
## TOOTHED TOOL AND DEVICE FOR CHIPLESS GENERATION OF GEARS

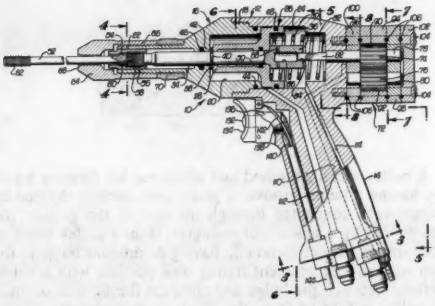
Herbert Loos, and Karl Kretzschmar, both of Munich, Germany, assignors to Carl Hurth Maschinen und Zahnradfabrik, Munich, Germany

Filed Dec. 15, 1969, Ser. No. 884,870
Claims priority, application Germany, Dec. 18, 1968, P 18 15 289.1
Int. Cl. B21h 5/02
U.S. Cl. 72—88 9 Claims



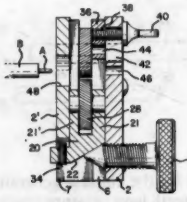
A toothed tool for the chipless generation of gears of the type wherein the teeth have pressure concentrating serrations extending from at least near the addendum thereof to a point at least near the dedendum thereof. These serrations define ribs on the toothed flanks by which the pressure part of the tool is transmitted in a concentrated manner onto the workpiece. In the present invention, the tool is of generally elongated or rack-like shape and moves substantially rectilinearly with respect to the periphery and teeth of the workpiece. Any suitable means are provided to create the necessary pressure between the tool and the workpiece.

3,654,792
## APPARATUS AND METHOD FOR INSTALLING BLIND FASTENERS
Daniel R. Mead, Hawthorne, Calif., assignor to Briles Manufacturing, El Segundo, Calif.
Filed July 25, 1969, Ser. No. 844,894
Int. Cl. B21d 9/05
U.S. Cl. 72—114 23 Claims



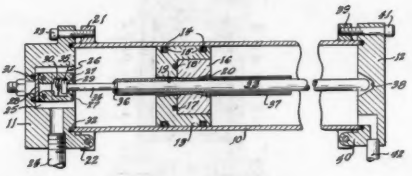
An automatically sequencing, hydraulically powered preentry pull-up tool for upsetting blind fastener sleeves on the blind side of a structure, and a novel sequencing method employed by said tool to assure complete and uniform fastener upsetting. The tool includes a hand gun having a protruding threaded mandrel insertable into a blind fastener sleeve to be upset, the mandrel rotating in one direction to engage with the sleeve, axially retracting to pull up and upset the sleeve, and then rotating in the opposite direction to disengage from the sleeve, these three steps being hydraulically powered in the hand gun by hydraulic power from a remote source, and being electrically controlled. According to the method of the disclosure uniform upsetting is assured by effecting the automatic shifting from stage to stage of the operation by sensing back pressure in the hydraulic system.

3,654,793
## KNURLING TOOL
George William Ziegler, Jr., Carlisle; Armand Samuel Apa, Camp Hill, and Donald Elwood Heffner, Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Feb. 27, 1970, Ser. No. 15,173
Int. Cl. B21d 19/00
U.S. Cl. 72—125 6 Claims



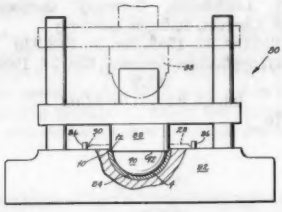
The disclosure relates to a knurling tool of small dimensions which can located a knurl about the periphery of an outer conductor of a coaxial cable at a selected one of a plurality of fixed distances from the end of the conductor. The manual controls for effecting the selection of the location and for positioning the knurling wheels against the conductor are both one one side of the tool and protrude in a direction parallel to the wheel axes.

3,654,794
## DRAWBENCH
Stephen B. Brak, Tinley Park; Clarence Steves, Hickory Hills, both of Ill., and Ross M. Mayfield, deceased, late of Glen Ellyn, Ill. (by Georgia P. Mayfield, sole heir), assignors to The United States of America as represented by the United States Atomic Energy Commission
Filed Mar. 7, 1969, Ser. No. 805,383
Int. Cl. B21c 3/12
U.S. Cl. 72—285 6 Claims



A device and method for drawing tubes and rods wherein the workpiece is fixed within a hydraulic cylinder and the die, acting as a piston, is moved along the workpiece.

3,654,795
## PROCESS FOR PRODUCING CUP-SHAPED OBJECTS HAVING AXIALLY EXTENDING LIPS
Elmer C. Freber, St. Louis, Mo., assignor to Marquette Tool and Die Company, St. Louis, Mo.
Filed Jan. 14, 1970, Ser. No. 2,855
Int. Cl. B21d 31/02, 28/00
U.S. Cl. 72—329 10 Claims

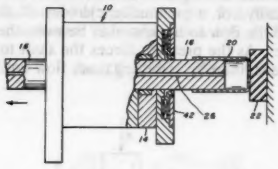


A cup-shaped object having an axially extending lip is produced by blanking a disk from flat stock, coining a recess into the periphery of the disk, and finally forming the disk into a cup-shaped configuration. During the forming step, the peripheral portion of the disk at the coined recess is transformed into an axially extending lip.

3,654,796
## METHOD AND APPARATUS FOR STRIPPING CONTAINER BODIES FROM A RECIPROCAL MANDREL
Lloyd G. Dunn, Lower Burrell, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.
Filed Mar. 17, 1970, Ser. No. 20,297
Int. Cl. B21d 45/00
U.S. Cl. 72—345 1 Claim

A method and apparatus are provided for stripping container bodies from a reciprocal mandrel in an ironing press at the completion of the ironing stroke, which includes a resilient pad which is positioned adjacent the exit end of the last ironing ring and aligned with the mandrel for abutment of a container body on the mandrel against the pad at the completion of the ironing stroke, and means for introducing compressed gas into the container body being ironed prior to

completion of the ironing stroke. The compressed gas in the container will hold the container body against the resilient



pad whereby the mandrel may be withdrawn from the container during its return stroke.

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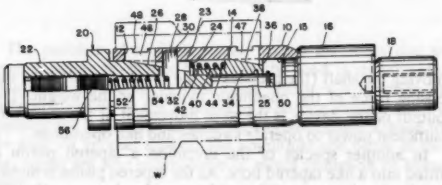
**3,654,797**
**EXPANDING ARBOR FOR TAPERED HOLES**
**Lily G. Skaisey, Detroit, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.**
**Filed Mar. 5, 1970, Ser. No. 16,748**
**Int. Cl. B23b** *31/40*
**U.S. Cl. 72—393** **7 Claims**



An expanding arbor having at least two axially spaced sets of radially movable keys, wedge means for effecting positive outward movement of one set of keys, and resiliently urged wedge means for producing outward movement of the other set of keys to provide accurate centering irrespective of possible variations in diameter in an opening in which the arbor is engaged.

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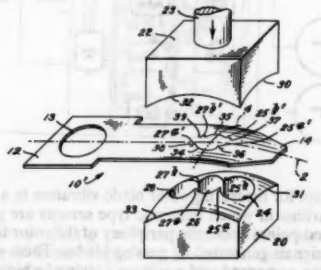
**3,654,798**
**APPARATUS FOR MAKING A SNAP ACTING THERMOSTATIC ELEMENT**
**Hamlet D. Vezza, Seekonk, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.**
**Original application Apr. 28, 1969, Ser. No. 819,868, now Patent No. 3,562,690. Divided and this application July 30, 1970, Ser. No. 59,386**
**Int. Cl. B21j** *13/02*
**U.S. Cl. 72—412** **2 Claims**



A thermally responsive multimetallic element formed with a dished area to make it snap acting is provided with a plurality of deformations formed in pairs in the dished portion of the strip with each pair comprising two points and ridge connecting each point in a pair with a corresponding point in the adjacent pair. These deformations enhance the snap characteristics of the element and reduce creep prior to snap action of the element from one configuration to another at a critical temperature.

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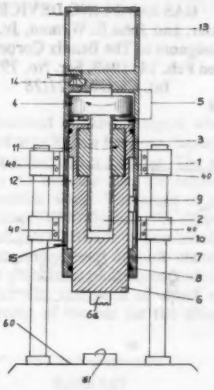
**3,654,799**
**PRESS ASSEMBLY**
**Helmut Dischler, Am Kreuzfeld, Germany, assignor to Becorit Grubenausbau GmbH, Recklinghausen, Germany**
**Filed Feb. 20, 1970, Ser. No. 13,103**
**Claims priority, application Germany, Mar. 1, 1969, P 19 10 507.8**
**Int. Cl. B21j** *9/12*
**U.S. Cl. 72—454** **8 Claims**



A sheet metal working or other press is operated say pneumatically. Movement of the press moves a freely rotatable screw relative to a freely rotating nut of a screw-and-nut mechanism so both spin in opposite directions storing energy which is released when the movement of the press is arrested during deformation of the workpiece. Either the screw or nut moves with the movable part of the press and the other is immovable in a casing. No rotary impact couples are transmitted to the frame of the machine when the press is arrested.

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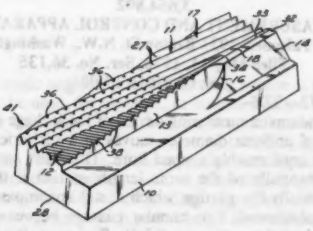
**3,654,800**
**SELF-POINTING THREAD ROLLING DIES**
**Herbert L. Yankee, North Royalton, Ohio, assignor to Pratt & Whitney Inc., Cleveland, Ohio**
**Filed Nov. 24, 1969, Ser. No. 879,255**
**Int. Cl. B21h** *3/06*
**U.S. Cl. 72—469** **20 Claims**



A pair of self-pointing thread rolling dies is illustrated for forming a threaded and pointed screw from an unpointed

blank having excess material in the shank. During the rolling operation the excess material is formed into a slug which is separated from the finished screw. Each die includes a slug forming surface formed with driving serrations thereon. The projections of the serrations into the plane of movement of the axis of the blank are inclined with respect to a referenced plane perpendicular to the direction of relative die movement. The inclined serrations provide a smoother drive for the slug and improve the uniformity of location of slug separation so that the uniformity of the screws formed by the dies is improved. The point burning of the screw is also reduced and die life is improved. In one embodiment the serrations are inclined in the same general direction with respect to the referenced plane and in another embodiment, they are inclined in opposite directions with respect thereto.

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**3,654,801**

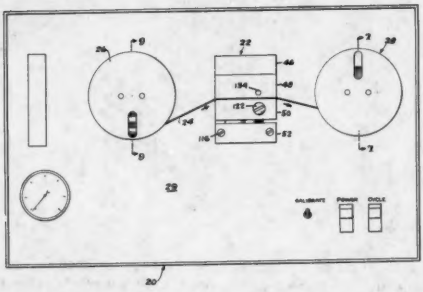
**GAS SAMPLING DEVICE**

**Richard D. Keefer, and John S. Wyman, Jr., both of Ann Arbor, Mich., assignors to The Bendix Corporation**

**Filed Feb. 14, 1969, Ser. No. 799,367**

**Int. Cl. G01n** *21/28*

**U.S. Cl. 73—28** **8 Claims**



A gas sampling device having a sampling head with supply and take-up reels mounted on opposite sides of the head to accommodate a filter material in tape form. The sampling head has two blocks which are yieldably urged toward each other to clamp a portion of the filter tape between the blocks. Each block is formed with a gas chamber which is positioned so that a sample of gas can be passed through the filter tape between the blocks. A spool with cam surfaces having serrated teeth is connected to one of the blocks and positioned so that when the spool is rotated the cam surfaces momentarily shift one of the blocks away from the other block and advance the filter tape through the head. The supply reel is connected to a drag clutch and the take-up reel is driven through a friction clutch so that the tape is always under a slight tension.

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**3,654,802**

**MEASUREMENT AND CONTROL APPARATUS**

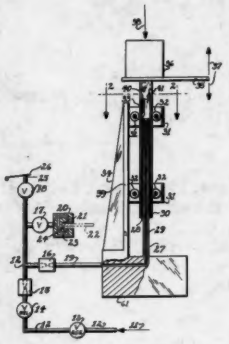
**David G. Falconer, 3931 Benton St. N.W., Washington, D.C.**

**Filed May 11, 1970, Ser. No. 36,135**

**Int. Cl. G01b** *13/00*

**U.S. Cl. 73—37.5** **14 Claims**

In a pneumatic measuring device of the leakage input type, a shaft of uniform diameter moves in a reciprocal manner within a conformably shaped bore. The shaft and the bore are substantially of the same length so that if the shaft is moved axially the portion which is still encompassed by the bore is shortened. This annular passage between the shaft and the bore is used as a variable flow area. Pressure regulated compressed air on the upstream side of a line restriction is fed into a conduit which branches; one branch goes to a leakage input signal; the other branch goes to a chamber between the end of the shaft and the end bore; this chamber is closed except for the annulus. Opposing the movement of the shaft is either a weight (when the shaft and bore are pointed vertically) or a pneumatic cylinder. If the leakage input is varied the flow to the chamber between the shaft and the bore varies. As the pressure forces the shaft to move the annulus shortens, thereby admitting more flow until the force



moving the shaft (the pressure X the area) is equal to the opposing force of the pneumatic cylinder or the weight. The output of the device is the axial movement of the shaft with sufficient power to operate switches and like operations.

In another species of the invention a tapered piston is fitted into a like tapered bore. As the tapered piston is moved axially in the tapered bore the annulus between them is widened to vary the flow.

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**3,654,803**

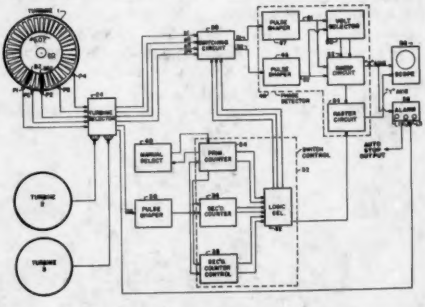
**SYSTEM FOR MEASURING ROTOR BLADE VIBRATION**

**Raymond A. Robinson, Lake Circle Drive, Tullahoma, Tenn.**

**Filed Oct. 2, 1970, Ser. No. 77,628**

**Int. Cl. G01h** *11/00*

**U.S. Cl. 73—71.4** **11 Claims**



A system for measuring rotor blade vibration in a compressor or turbine in which magnetic type sensors are positioned at selected points about the periphery of the rotor to produce pairs of signals generated by passing blades. These signals are then phase compared and a voltage obtained which is indicative of whether one signal leads or lags another and the magnitude of the lead or lag.

3,654,804

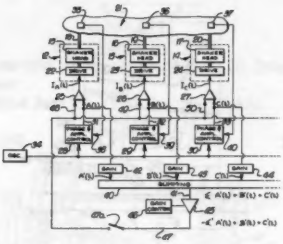
## STABILIZATION OF MULTIPLE SHAKER SYSTEMS

James G. Helmuth, Monrovia, Calif., assignor to Chadwick-Helmuth Electronics, Inc., Monrovia, Calif.

Continuation-in-part of application Ser. No. 606,657, Jan. 3, 1967, now abandoned. This application Apr. 8, 1970, Ser. No. 26,602

Int. Cl. G01m 7/00

U.S. Cl. 73—71.6 10 Claims



The problem of multiple shaker system instability due to cross-coupling of shaker drives via the load is significantly reduced by furnishing a bias signal which is a function of force application to the load via at least one shaker, and by applying the bias signal to bias the vibratory drive applied to the load via another shaker. The amplitude and phase of the bias signal are also controllable to effect reduction of instability.

3,654,805

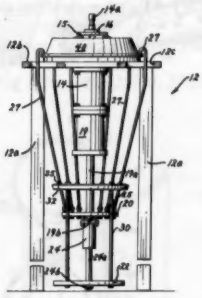
## CLUTCH REBUILDING AND TESTING MECHANISM

Robert L. Ashby, 3018 Ashwood Avenue, Evansville, Ind.

Filed June 19, 1970, Ser. No. 47,766

Int. Cl. G01m 13/02

U.S. Cl. 73—118 7 Claims



A clutch rebuilding and testing mechanism characterized by the use of three cooperating power members arranged to simply and positively control structure which positions the clutch for servicing without the need for any superstructure above such clutch.

3,654,806

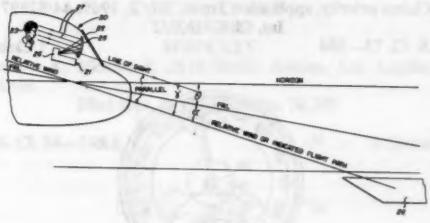
## AIRCRAFT INSTRUMENT

Charles Donald Bateman, Bellevue, Wash., assignor to Sundstrand Data Controls, Inc.

Filed June 18, 1970, Ser. No. 47,517

Int. Cl. G01c 21/00

U.S. Cl. 73—178 R 9 Claims



An aircraft instrument utilizing a signal which represents the aircraft angle of attack, in a head-up display, to direct the pilot during the approach to a landing. The signal drives a bar in the display to indicate the touchdown point, with reference to the outside world. The angle of attack signal is pitch stabilized to improve its flyability. A signal representing a change in aircraft pitch attitude is combined with a signal representing a change in aircraft attitude caused by the pilot to distinguish wind gusts from pilot commands and the resulting signal combined with the angle of attack signal to compensate the movement of the bar for the effect of gusts on the aircraft.

3,654,807

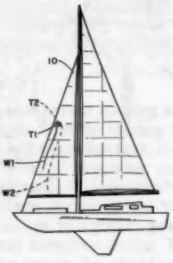
## ANGLE OF ATTACK INDICATING SYSTEM

Donald Stephen Deskey, 9838 Burgen Avenue, Los Angeles, Calif.

Filed Jan. 30, 1970, Ser. No. 7,287

Int. Cl. G01c 21/00

U.S. Cl. 73—180 6 Claims



An electronic angle of attack indicating system is provided which may be used, for example, to indicate the sail trim of a sailboat, or the angle of attack of an aircraft, or the like, so that the sail or the aircraft may be maintained at any preset attack angle. The system of the invention uses a pair of temperature sensitive devices, such as thermistors, which are mounted on either side of the leading edge of an airfoil, such as a sail or wing, and which sense the air flow differential on the opposite sides of the airfoil, by virtue of the resulting temperature differences. An electric indicating system coupled to the temperature sensitive devices indicates the ex-

istence of the air flow differential, so that the appropriate adjustments may be made to maintain the preset attack angle.

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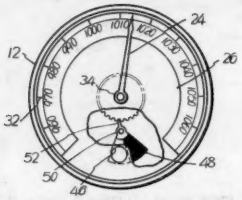
**3,654,808**
**BAROMETER**

**Shoichi Fukumoto, Osaka, Japan, assignor to Fujiya Co. Ltd., Osaka, Japan**

**Filed June 29, 1970, Ser. No. 50,856**
**Claims priority, application Japan, July 2, 1969, 44/52897**
**Int. Cl. G01l 7/12**
**U.S. Cl. 73—384** **1 Claim**




A barometer comprising means for measuring atmospheric pressure, a barometric scale for indicating the measure atmospheric pressure, a scale pointer operatively connected to the measuring means and indicator means for directly indicating whether the atmospheric pressure is rising or falling. The indicator means is operated in response to movements of the measuring means to selectively give pressure rise and pressure fall indications.

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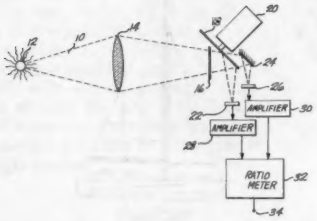
**3,654,809**
**TEMPERATURE MEASUREMENT TECHNIQUE AND APPARATUS**

**John R. Worden, Tacoma, and Albert W. Kratzke, Bellevue, both of Wash., assignors to The Boeing Company, Seattle, Wash.**

**Filed May 5, 1969, Ser. No. 821,602**
**Int. Cl. G01j 5/10, 5/60**
**U.S. Cl. 73—355 R** **6 Claims**

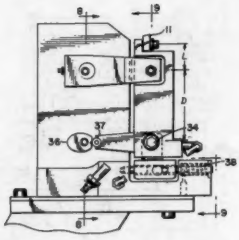



Method and apparatus for remotely measuring absolute color temperature wherein radiation emitted from a source is collected, divided into two parts at least one of which is subjected to spatial spectral filtering, and directed upon a time shared detector to generate two sets of electrical signals which, when ratioed, provide an output signal proportional to a selected power of the absolute color temperature of the source. In another embodiment, the source radiation is directed upon both an energy and a quantum detector, and the respective detector output signals ratioed to obtain a signal directly proportional to the absolute color temperature of the source.

**3,654,810**
**CAN WELDING INDEXER**

**Anton A. Aschberger, Oak Lawn, and Herbert D. Bartels, Palos Heights, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.**

**Original application Jan. 23, 1969, Ser. No. 793,271, now Patent No. 3,544,743. Divided and this application May 12, 1970, Ser. No. 36,541**
**Int. Cl. F16h 25/08**
**U.S. Cl. 74—54** **7 Claims**




An indexer for turning a can on which the seam has not been fully welded so that the welding current goes through different parts of the electrode as successive can seams are turned and the electrode erodes across a wide area instead of at one point. This prolongs electrode life.

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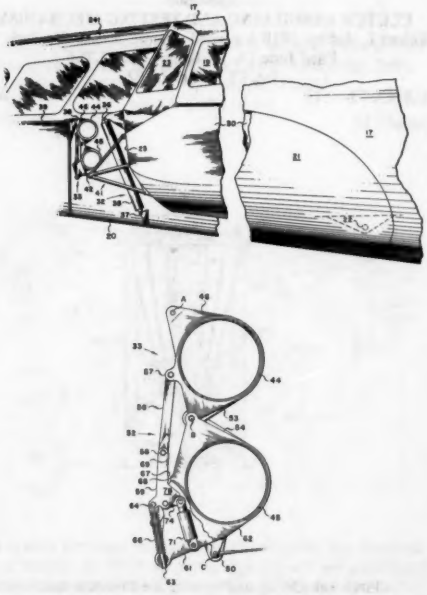
**3,654,811**
**FOLDABLE LOAD BEARING MECHANISM AND ACTUATING DEVICE**

**Carlton G. Peterson, Altadena, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.**

**Filed Jan. 2, 1970, Ser. No. 324**
**Int. Cl. F16h 21/44**
**U.S. Cl. 74—101** **11 Claims**




1. A structural load bearing mechanism for transmitting loads, moments and couples from an aircraft nose to its

fuselage, rigidity between nose and fuselage being likewise transmitted through such mechanism;

2. means for locking such mechanism in either of two positions; and

3. an actuating mechanism for positioning nose relative to fuselage upon adapting 1 and 2 above to a supersonic aircraft, for supersonic and subsonic flight conditions.

Such adaptation provides a streamlined configuration of nose to fuselage for supersonic flight conditions, while for either supersonic or subsonic flight, maximized visual observation from a pilot's station in the aircraft is achieved.

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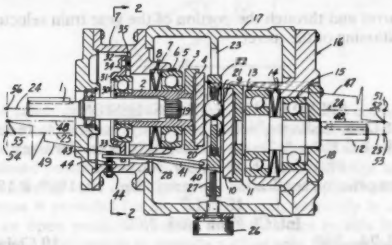
**3,654,812**

**BALL-DISK DRIVE**

**William S. Rouverol, Boite Postale, No. 8, 20 Saint Florent, Corse, France**

**Filed June 29, 1970, Ser. No. 50,536**
**Int. Cl. F16h** *15/38*
**U.S. Cl. 74—200** **21 Claims**



A construction for a ball-disk drive wherein the bearings for one disk are mounted in a manner insuring perfect self-alignment of the disks and hence equal load on all the cage balls. The cage-positioning mechanism is utilized to apply a variable couple to one of the disk shafts sufficient to exactly offset the cocking moment due to cage eccentricity.

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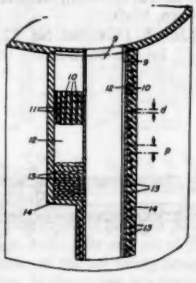
**3,654,813**

**ANNULAR STRUCTURES REINFORCED WITH TEXTILE ELEMENTS, IN PARTICULAR, RUBBING ELEMENTS FOR CARDING MACHINES**

**Ermenegildo De Santis, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy**

**Continuation of application Ser. No. 654,767, July 20, 1967, now abandoned. This application Aug. 19, 1970, Ser. No. 65,249**
**Claims priority, application Italy, July 27, 1966, 17355/66; May 11, 1967, 1598A/67**
**Int. Cl. F16g** *1/26;* **D01g** *25/00, 27/00*
**U.S. Cl. 74—232** **18 Claims**



A rubber structure adapted for use as an accessory in machines for the textile industry, which includes an annular sheet of rubber composition forming the underlayer of the structure, a layer of cord fabric suitably treated or made adhesive and disposed over the sheet with its cords extending parallel to the axis of the structure, and an additional sheet of rubber composition extending over the layer of cord fabric. A layer of textile reinforcement constituted by a cord or twisted yarn is helically wound up at a small pitch on the additional sheet of rubber composition and is covered by an additional sheet of rubber composition.

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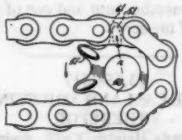
**3,654,814**

**SPROCKET**

**Moscow K. Richmond, 2819 Butler Avenue, Los Angeles, Calif.**

**Filed Sept. 8, 1970, Ser. No. 70,389**
**Int. Cl. F16h** *55/30*
**U.S. Cl. 74—243 R** **6 Claims**



A sprocket having a raised head on each side of every tooth can be used to reduce noise, wear and vibration in chain driven power transmission systems.

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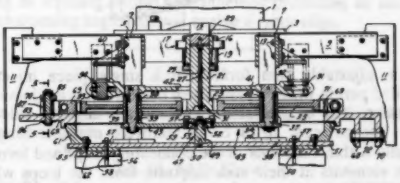
**3,654,815**

**MECHANICAL GEAR DRIVE**

**Hans D. Dehne, King of Prussia, Pa., assignor to Crane Co., Chicago, Ill.**

**Filed Dec. 14, 1970, Ser. No. 97,601**
**Int. Cl. F16h** *57/00*
**U.S. Cl. 74—410** **14 Claims**



A gear drive arrangement for rotating a ring gear of large diameter, as commonly used for rotating the rake structure for a slurry agitator, sedimentation tank, or the like. The gear drive incorporates a novel mounting and torque reactor device on which a plurality of gear members are positioned which equally distribute the torque to the ring gear. The planetary gears are driven by a pinion gear which is flexibly suspended from a gear reduction device. The tension device includes an indicator means for visual observation of the torque being transmitted to the ring gear and rake structure at a given time.

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**3,654,816**

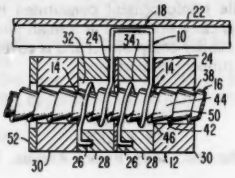
**SCREW ENGAGING DEVICE**

**Jack Beery, Farmington, and Zong-Shyong Luo, Plymouth, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.**

**Filed Dec. 1, 1970, Ser. No. 94,107**
**Int. Cl. F16h** *1/18, 55/22*
**U.S. Cl. 74—424.8 R** **10 Claims**

A device for controllably engaging the helical thread of a screw wherein a spring member is disposed concentrically

about a portion of the outer diameter of the screw in substantial alignment with the helical thread thereof, one end of the spring member being rotatably restrained by a support and



the other end of the spring member being bidirectionally rotatable about the screw for diametrically contracting and dilating the spring member into and out of engagement with the helical thread of the screw.

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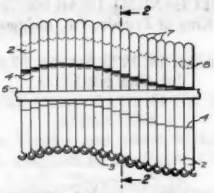
**3,654,817**
**ADJUSTABLE CAM AND ADJUSTING MEANS THEREFOR**

**Neil G. Kane, Hacienda Heights, Calif., assignor to Rain Bird Sprinkler Mfg. Corp., Glendora, Calif.**

**Filed May 6, 1970, Ser. No. 35,091**
**Int. Cl. F16h** *53/00*
**U.S. Cl. 74—568 R** **7 Claims**



An adjustable cam formed of a single piece injection molded part in which a plurality of narrow strips are joined at common ends by yieldable loops and are disposed side-by-side; the adjacent strips being relatively movable longitudinally within the limits of the connecting loops and forming cam elements at their ends opposite from the loops which may be displaced to define collectively an adjustable cam surface. An embodiment of the adjustable cam includes a lateral extension on each strip forming opposed cam elements, and the cam is arranged in a circle. A cam adjusting means, including cam adjusting rollers, is rotatably mounted within the circle, and pivotal about a transverse axis so that by turning and pivoting the adjusting means, the cam strips are moved longitudinally to change the contour of the cam.

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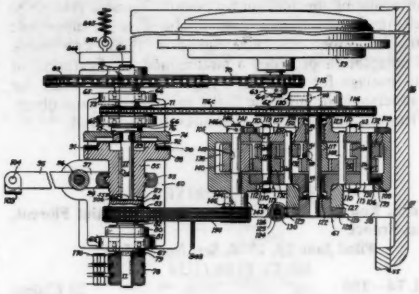
**3,654,818**
**UNIVERSAL MILLING AND BORING MACHINES**

**Leo L. Hengehold, 5963 Harrison Avenue, Miami Township, Hamilton County, Ohio**

**Continuation of application Ser. No. 806,259, Apr. 14, 1959, now Patent No. 3,232,171. This application Apr. 23, 1965, Ser. No. 450,466**
**Int. Cl. F16h** *3/08*
**U.S. Cl. 74—331** **3 Claims**

The technical disclosure of the following specification is of a universal jig boring and milling machine for performing a wide variety of operations upon a workpiece mounted on the table of the machine. The machine's speed of feed operation is selected by positioning of a feed turret carrying a gear train so that power from the principal power source is fed to the



feed turret and through the portion of the gear train selected by positioning of the turret.

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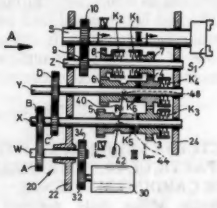
**3,654,819**
**SPEED CHANGE TRANSMISSION**

**Helmut Link, Esslingen/Neckar, Germany, assignor to Index-Werke KG Hahn & Tessky, Esslingen/Neckar, Germany**

**Filed Sept. 2, 1970, Ser. No. 68,855**
**Claims priority, application Germany, Sept. 10, 1969, P 19 45 721.7**
**Int. Cl. F16h** *3/08, 3/00*
**U.S. Cl. 74—360** **10 Claims**



A speed change transmission including four transmission shafts, six transmission gears, six clutch means, and change gears, is arranged in such a manner that at the output shaft, four reversable different speeds are obtained.

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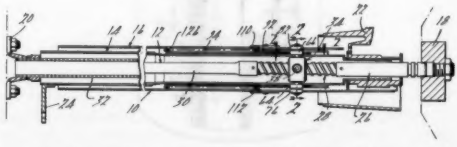
**3,654,820**
**STEERING SYSTEM WITH POWERED RECOVERY MECHANISM**

**Moses Shachter, Oak Park, Mich., assignor to Ford Motor Company, Dearborn, Mich.**

**Filed July 6, 1970, Ser. No. 52,307**
**Int. Cl. B62d** *1/16*
**U.S. Cl. 74—495** **4 Claims**



A steering system for a motor vehicle which in its presently preferred embodiment has a power steering gear, a steering

wheel and a steering shaft connecting the steering wheel to the steering gear. The steering shaft has a worm gear portion and a ball nut operably engaging the worm gear portion. A coil spring engages the nut and exerts a force tending to maintain the steering wheel and steering shaft in a central position.

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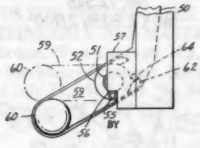
**3,654,821**
**PERSONNEL SAFETY GUARD FOR MACHINERY**
**Tom T. Mikulin, 1469 Bellevue Avenue, Burlingame, Calif.**
**Filed May 11, 1970, Ser. No. 36,266**
**Int. Cl. F16p *3/00***
**U.S. Cl. 74—612** **4 Claims**



A safety guard to prevent injury to personnel in connection with the operation of machinery. The guard comprises a plurality of horizontally disposed elongated panels supported in a closed position with the panels in substantially edge to edge relationship and combining to cover the hazardous area. Means is provided for moving the panels vertically in unison to an open position wherein the panels are in side by side stacked relationship to provide a clear area for access to the machine. The guard is arranged to be readily operated without effort by the operator and to provide optimum safety.

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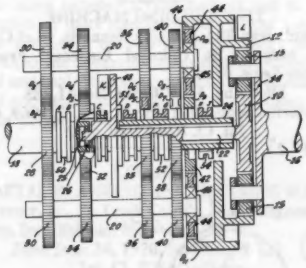
**3,654,822**
**MULTIPLE COUNTERSHAFTS TRANSMISSION**
**Robert B. Singer; Earl B. Muir, both of Palos Verdes, and Andrew J. Kotzar, Lynwood, all of Calif., assignors to White Motor Corporation, Cleveland, Ohio**
**Continuation of application Ser. No. 708,254, Feb. 26, 1968. This application May 1, 1970, Ser. No. 31,851**
**Int. Cl. F16h *37/08*, *3/00***
**U.S. Cl. 74—681** **32 Claims**



A gearset including an input shaft, multiple identical countershafts, a quill shaft and appropriate gears and clutches provides choice among multiple paths of power flow to a ring gear and as well as to a sun gear of a set of planetary gearing, the planet gear carrier of the set being connected to an output shaft. In addition, brake means are provided to selectively immobilize the ring gear and the sun gear. The clutches and brakes may be operated in various combinations to provide a progressive series of 32 ratios of speed output to speed input. Gear shift control units may be mounted on the basic transmission assembly interchangeably to provide gear ratios selected from the 32 overall ratios to transform the basic transmission assembly into anyone of five, six, seven, eight, nine, 10, 11, 12, 13 and 15 speed transmissions, there being a family of transmissions available in each category.

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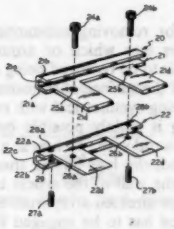
**3,654,823**
**BLADE SHARPENING GUIDE**
**John R. Juranitch, 932 South Layton Boulevard, Milwaukee, Wis.**
**Continuation-in-part of application Ser. No. 757,952, Sept. 6, 1968, now abandoned. This application May 1, 1970, Ser. No. 33,790**
**Int. Cl. B21k *11/02***
**U.S. Cl. 76—82** **7 Claims**



A clamp-type blade holder including blade edge angle determining bars for guiding the sharpening of a blade edge on a flat sharpening surface, such as a hone. The blade holder includes guide bars coacting with the blade edge to engage the hone and maintain the sharpening angle the same during all stroking on the hone, thereby producing an accurate sharpening angle that will enable a razor edge.

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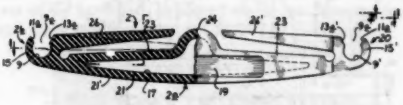
**3,654,824**
**FUSE EXTRACTOR UNIT**
**James M. Reed, Elk Grove Village, Ill., assignor to Littelfuse, Inc., Des Plaines, Ill.**
**Filed Mar. 11, 1970, Ser. No. 18,670**
**Int. Cl. B25b *27/14***
**U.S. Cl. 81—3.8** **10 Claims**



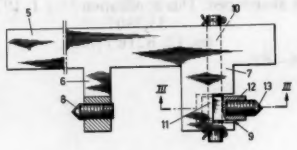
A fuse extracting unit comprising an elongated body made of insulating materials and having a handle portion to be grasped by one hand of the user and a fuse grasping portion at each end thereof, each fuse-grasping portion having a fuse-receiving aperture extending through the body and adapted to receive the fuse therein, the aperture extending to one lateral side of the body to provide a lateral entryway to the aperture.

**3,654,825**

## APPARATUS FOR LOOSENING THREAD PROTECTORS FROM TUBULAR BODIES

**Jan H. Moddemeijer, Heiloo, and Dirk Jogchum Zijlstra, Djakarta, both of Netherlands, assignors to Hoogovens Delfstoffen N.V., Ijmuiden, Netherlands**

**Filed Mar. 9, 1970, Ser. No. 17,372**
**Claims priority, application Netherlands, Mar. 11, 1967, 69,03768**
**Int. Cl. B25b** *13/48*
**U.S. Cl. 81—72** **5 Claims**



An apparatus for removing substantially hollow articles from other articles into which or around which they are clamped, the article to be removed being mainly symmetrical around an axis and the surface of the other article to which it is clamped also being symmetrical with respect to an axis so that the removing is mainly possible by rotation. The apparatus comprises a rod with two lugs at a distance from each other along the rod, the lugs having sharp protruding parts for engaging into the wall of the article to be removed. The protruding parts are directed away from each other if the article to be removed has to be engaged from the inside and are directed towards each other if the article to be removed has to be engaged from the outside. Means are present to move the protruding part(s) of at least one lug towards and away from the protruding part(s) of the other lug to allow the apparatus to be brought into the correct position with respect to the article to be removed in an easy manner and to thereafter cause the protruding parts to engage the article firmly to remove it by rotating the apparatus.

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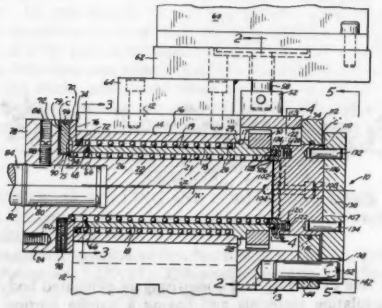
**3,654,826**

## ADJUSTABLE TOOL BLOCK ASSEMBLY

**Richard C. Gersch, 27401 Red Leaf Lane, Southfield, Mich.**

**Filed May 9, 1969, Ser. No. 823,343**
**Int. Cl. B23b** *39/00*
**U.S. Cl. 82—1.2** **7 Claims**



A tool block for a boring, turning, facing machine or the like in which a boring bar is adjustably supported within a housing of the block for axial and radial adjustment relative to the work surface. The boring bar is supported for axially sliding movement and is supported for radial movement within an eccentric rotatable sleeve surrounding the axial support, which is actuated for adjustment of retraction of the cutting tool from the workpiece by a reversible motor operating a gear arrangement to rotate the eccentric sleeve. When the eccentric sleeve is rotated in one direction, the cutting tool is adjusted relative to the work in response to wear of the tool and, if rotated in the other direction, the tool is retracted from the work surface.

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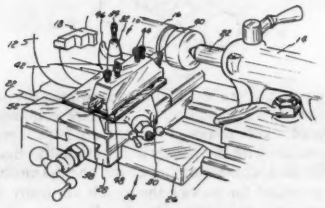
**3,654,827**

## TOOL HOLDER AND ATTACHMENTS FOR A LATHE

**Savarian F. Lemanski, 109 Taylor Street, Detroit, Mich.**

**Original application May 29, 1968, Ser. No. 732,995, now abandoned. Divided and this application Sept. 15, 1970, Ser. No. 72,525**
**Int. Cl. B23b** *21/00*
**U.S. Cl. 82—25** **7 Claims**



A lathe tool holder having an elongated body for supporting a tool in which the cutting ends of the tool extend from both ends of the body. A laterally extending arm joined to the body and adapted for mounting in the tool post of the lathe allows the holder to be mounted in two positions with the tool off-center from the tool post. In one position the cutting end of the tool extending from one end of the body is in a cutting position, and in its reversed position, the cutting edges at the other end of the body are in a cutting position. Adjustable feet under the tool holder provide means for precisely adjusting the height of the tool above the compound rest without shims. A pivotal arm on the body carries a second, finishing tool that can be mounted on a rough finish tool in the body; and a locator attachment on the tool holder provides means for locating the cutting tools for cutting a series of regularly spaced grooves in a workpiece.

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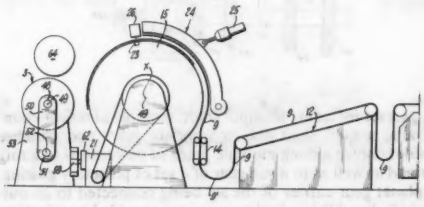
**3,654,828**

## TIRE BUILDING MACHINE

**Jean Leblond; Jean Biet, and Guy Danneels, all of Compiegne, France, assignors to Uniroyal Englebert France S.A., Neuilly-sur-Seine, France**

**Filed Aug. 5, 1970, Ser. No. 61,285**
**Claims priority, application France, Aug. 6, 1969, 6927064**
**Int. Cl. B26d** *5/20, 5/42*
**U.S. Cl. 83—23** **16 Claims**



The invention contemplates an improved structure and method for building breakers or belts for vehicle tires,

through precise pre-cutting of ply strips from web material and precise transfer to a breaker-building drum. Pre-cutting to length is accomplished by a ply-preparation device which includes a continuous and endless surface for supporting the lead strip in transiently adhered relation to said surface, plus means for the precise indexing displacement of the strip-laden surface to measure the predetermined ply length to be severed upon cut-off. Means are disclosed for the stress-free transfer of the severed ply strip and for the automatic recycled measurement and cut-off of the next ply strip. Means are also disclosed for the interlaced delivery of such plies from successive different stations to accomplish desired multiple-ply building of a particular breaker on the same drum, and for tread-application as part of the same machine cycle.

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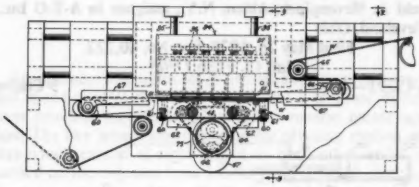
**3,654,829**
**APPARATUS FOR PUNCHING HOLES IN HEAT SHRINKABLE WEB MATERIAL**
**Andrew W. Anderson, West Caldwell, N.J., assignor to Scandia Packaging Machinery Company, North Arlington, N.J.**
**Filed July 29, 1969, Ser. No. 845,841**
**Int. Cl. B29c** *17/08*
**U.S. Cl. 83—78** **8 Claims**



A method and apparatus for punching holes in a web of material used in wrapping packages is provided. The web of material has a composition that will change shape when subjected to heat. Heated punches are used to form holes in the web of material and the heat from the punch affects the material along the periphery of the hole to form a thickened ridge therearound. The ribbed edges are reinforcements which prevent tearing of the material used in the wrapping process. The apparatus includes feed means for the web of material to move between a base support and at least one punch member. A more specific feature of the invention includes the use of a vacuum forming means to remove punchings from the apparatus when they are obtained from the web of material. Wrapping material that is adaptable to the method and apparatus of this invention includes compositions such as polypropylene.

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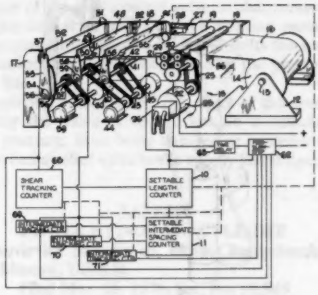
**3,654,830**
**SHEET METAL BLANKING AND SHEARING MACHINE**
**Fred C. Werner, Jr., St. Louis County, Mo., assignor to Engel Industries, Inc., Ballwin, Mo.**
**Filed June 24, 1970, Ser. No. 49,322**
**Int. Cl. B26d** *5/40*
**U.S. Cl. 83—208** **4 Claims**

Drawings of sheet metal blanks, for example those for ducts, are usually dimensioned from a leading edge. A machine having spaced-apart rams for blanking and shearing is provided with adjustable counters which may be set to dimensions called forth on the drawings. Electrical pulses generated by the flow of strip metal are counted from a datum position to the position of the first ram, used for blanking end notches. The physical spacings to an intermediate ram and to the shear are accounted for by preset




tracking counters whose count is additive to those of the adjustable counters.

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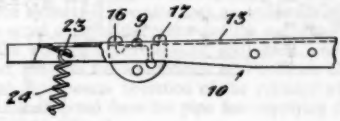
**3,654,831**
**KEYBOARD**
**Umberto Grilli; Bruno Sturba, and Artemio Vivani, all of 60020 Sirolo, Italy**
**Filed June 20, 1969, Ser. No. 835,137**
**Claims priority, application Italy, Aug. 29, 1968, 39379 A/68**
**Int. Cl. G10c** *3/12*
**U.S. Cl. 84—435** **14 Claims**




A key and mounting assembly for use in a keyboard of a musical instrument and the like. The assembly includes a key lever and a mounting element for pivotally mounting the key lever in the keyboard. Improved means are provided for connecting the mounting element to the key lever.

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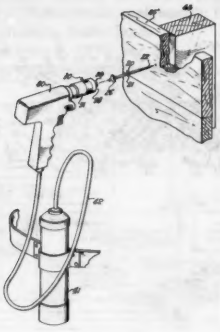
**3,654,832**
**NAIL SCREW FASTENING SYSTEM**
**Garnet L. Lana, 20133 Delita Drive, Woodland Hills, Calif.**
**Filed Oct. 21, 1968, Ser. No. 769,294**
**Int. Cl. F16b** *23/00, 25/00*
**U.S. Cl. 85—45** **3 Claims**

A nail screw fastening system comprising a novel nail screw together with a tool head for driving it, the nail screw being easily fabricable by rolling or stamping threads on the pointed end of stamped nail stock so that the thread ridges project radially outward beyond the nail shank, and by cutting V-shaped peripheral notches in the nail head to form flanges. The driving tool head is a cylindrical body adapted at

one end for coupling to a source of rotary motion and its other end having an axial passageway of uniform cross section complementary to the cross section of the screw nail head flange and terminating in a permanent magnet end wall.



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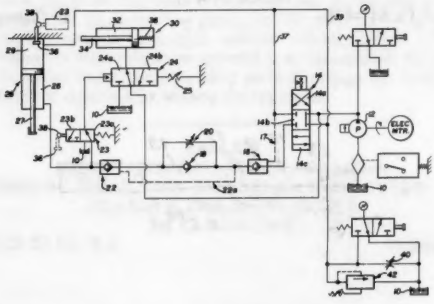
**3,654,833**
**HYDRAULIC CONTROL CIRCUIT**
**Thomas C. Griffiths, Chardon, Ohio, assignor to Eaton Yale & Towne Inc., Cleveland, Ohio**
**Filed June 29, 1970, Ser. No. 50,443**
**Int. Cl. F15b** *15/26, 11/08*
**U.S. Cl. 91—41** **5 Claims**



A hydraulic control circuit for raising or lowering a load includes a hydraulic ram having a movable load engaging piston therein and a pressure compensated hydraulic pump for supplying fluid thereto for raising a load. Means are provided in the circuit between the pump and the hydraulic ram for controlling the raising and lowering operations of the ram. Further means are provided for locking the position of the load in the event of mechanical or hydraulic failure of any portion of the load raising mechanism.

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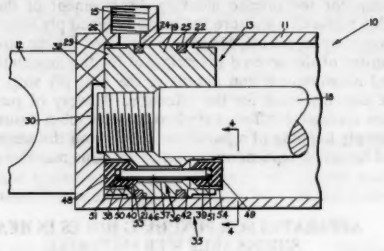
**3,654,834**
**FLUID BYPASS VALVE**
**Elie C. Sifri, and Matthew Shibahara, both of Portland, Oreg., assignors to Cascade Corporation, Portland, Oreg.**
**Filed May 27, 1970, Ser. No. 41,012**
**Int. Cl. F15b** *15/22*
**U.S. Cl. 91—399** **4 Claims**

A fluid bypass valve for a hydraulic ram. A fluid bypass channel is provided through the piston of a ram, that includes enlarged recessed portions opening on either side of the piston. A pair of elastomeric seals are reciprocally mounted in the recesses, secured to a pin that is slidable within the channel. Fluid pressure on either side of the piston acts upon the seal on that side of the piston forcing it into the recess to seal the bypass channel, with the seal at the other end of the pin extending beyond the surface of the piston. When used to reduce shock at the end of a piston stroke the seals move to open up the bypass channel.



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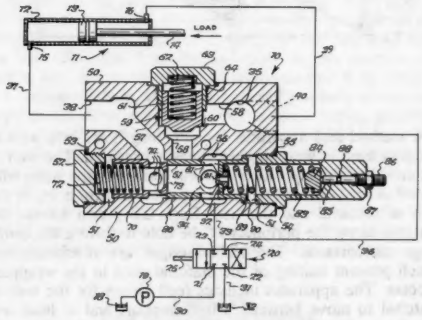
**3,654,835**
**REGENERATION VALVE**
**Donald A. Sievenpiper, Alden, N.Y., assignor to A-T-O Inc., Cleveland, Ohio**
**Filed May 25, 1970, Ser. No. 40,222**
**Int. Cl. F15b** *11/08*
**U.S. Cl. 91—436** **9 Claims**

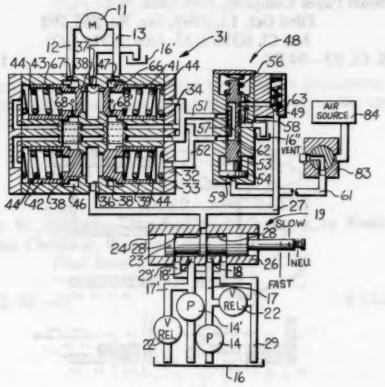


A valve comprising a housing having an elongated chamber therein and first, second and third passages intersecting the chamber for connecting the chamber to corresponding valve ports. A generally hollow cylindrical flow controlling member is biased by a spring in a position normally closing the third passage from the chamber, and a generally hollow cylindrical flow responsive member is biased in the chamber axially adjacent and normally abutting the flow controlling member. The flow controlling member and the flow responsive member together define a flow path between the first and second passages, and the flow responsive member is provided with a restricted passage which defines a constriction in the flow path. In an illustrative application, the second and third passages of the valve are connected to the piston and rod ends, respectively, of an hydraulic cylinder, and fluid is supplied to and exhausted from the valve in a direction and at a rate determined by a conventional directional control valve. The valve of the present invention functions to provide a direct flow path from the piston to the rod end of the hydraulic cylinder when the rate of fluid flow, as controlled externally by the direction control valve, reaches a predetermined magnitude.

## 3,654,836
## FLUID MOTOR CONTROL SYSTEM

Lawrence F. Schexnayder, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed June 3, 1970, Ser. No. 42,934
Int. Cl. F15b *13/042*
U.S. Cl. 91—448 3 Claims

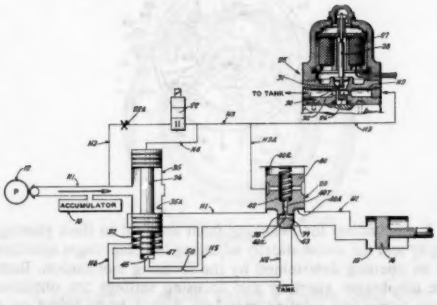



An operator's actuator lever provides for starting, stopping and speed control of a fluid motor and a separate direction lever provides for selecting forward or reverse motor operation. The two levers are supported for pivoting motion along arcs which extend at right angles to each other and a stop carried on the actuator lever blocks shifting of the directional lever except when the motor is stopped thereby avoiding damage to mechanism driven by the motor from sudden reversal at high speeds. Through fluid lines, the levers condition a compact simplified valve assembly which directs driving fluid to a selected side of the motor at a selected rate and which also functions as a make-up valve to avoid cavitation and as a lock valve to resist motor movement by external load forces acting on the mechanism connected to the motor.

## 3,654,837
## HYDRAULIC CONTROL SYSTEMS

Kenneth K. Knapp, Columbus, Ohio, assignor to Abex Corporation, New York, N.Y.

Filed Dec. 29, 1969, Ser. No. 888,533
Int. Cl. F15b *13/042*
U.S. Cl. 91—461 3 Claims



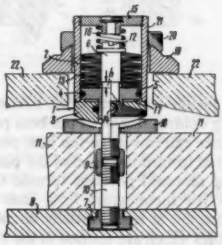
A hydraulic system comprises a source of fluid under pressure, supplying working fluid through a supply line, and a flow control valve of the spool type is interposed in the supply line between the source and the work performing means. The flow control valve is itself controlled by pressure in two pilot lines. One pilot line tends to open the valve, and pressure therein is controlled by a variable pressure control valve. The second pilot line is connected to the supply line downstream of the flow control valve so that pressure in the second pilot line is an analog of the working pressure. The analog pressure in the second pilot line shifts the spool to its closed position at a value determined by the pressure in the first pilot line.

In the specific embodiment, the effect of the second pilot line closing the valve is to prevent an accumulator, the source of pressure, from being dumped or vented to the tank at a time when a relief valve in the supply line is opened.

## 3,654,838
## POWER HYDRAULIC CYLINDER

Izrail Yakovlevich Shimilevich, ulitsa Chernyshevskogo, 3/7 kv. 43, Moscow, U.S.S.R.

Filed Mar. 16, 1970, Ser. No. 19,845
Int. Cl. F15b *15/26*
U.S. Cl. 92—24 3 Claims

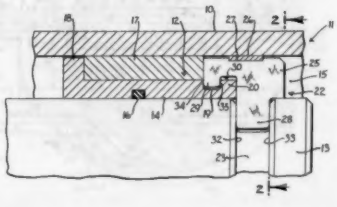


A power hydraulic cylinder for fastening workpieces to be machined in which a piston and a rod of the cylinder are mounted so as to be capable of displacing relative to each other. The cylinder is provided with an accumulating spring which is acted upon by the piston and the rod under the action of the working liquid pressure, and which, while being deformed, provides for preservation of a constant clamping force and autonomous operation of the cylinder when the latter is disconnected from the pipe line supplying the high pressure working liquid.

## 3,654,839
## PISTON AND ROD ASSEMBLY

Glenn S. Thompson, Brown Deer, Wis., assignor to Koehring Company, Milwaukee, Wis.

Filed Mar. 6, 1970, Ser. No. 17,125
Int. Cl. F01b *13/04*
U.S. Cl. 92—200 5 Claims



A single split ring retainer is cooperable with abutments on a rod encircled thereby and with other abutments on an an-

nular piston seated on the rod to establish an axial thrust transmitting connection between the piston and rod. The thrust transmitting connection is maintained effective only as long as the retainer is held against lateral displacement from the rod by the wall of the cylinder for which the assembly is intended.

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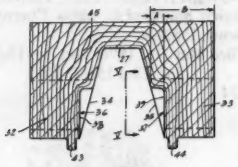
**3,654,840**

**FORGED PISTON WITH CIRCUMFERENTIAL GRAIN FLOW AROUND UPPER REGION OF WRIST PIN BORE AND METHOD OF PRODUCING SAME**

**Robert L. Elliott, Pepper Pike Village, Ohio, assignor to TRW Inc., Cleveland, Ohio**

**Filed Sept. 8, 1970, Ser. No. 70,205**
**Int. Cl. F16j *1/00*; B23p *15/10***
**U.S. Cl. 92—222** **5 Claims**



Heavy duty piston and method of making the same, the piston including confronting wrist pin boss portions, the walls defining the inner extremities of the boss portions being convergingly inclined toward the head of the piston, and the boss portions having recessed portions formed therein of a contour such that the metal grain flow lines surrounding the recessed portions are at least partially circular in the area of the wrist pin holes which are formed in the bosses.

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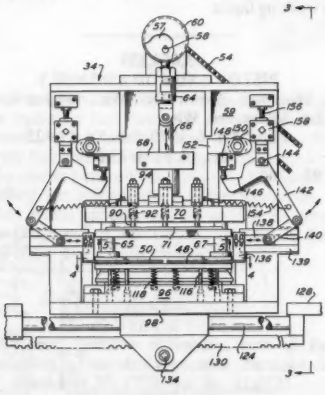
**3,654,841**

**MACHINE FOR MAKING PLASTIC BAGS**

**Francis A. Davis, Jr., Lansdale, Pa., assignor to Paramount Packaging Corporation, Chalfont, Pa.**

**Continuation-in-part of application Ser. No. 726,897, May 6, 1968, now Patent No. 3,534,665, dated Oct. 20, 1970. This application Oct. 20, 1970, Ser. No. 82,257**
**Int. Cl. B31b *1/14***
**U.S. Cl. 93—33 H** **10 Claims**



A machine for making open-gusset bags from thermoplastic material is disclosed. Reciprocating blades are disposed within the gusset to open the gusset after a generally V-shaped notch is removed from the gusset and before the web is divided into bags by transverse welds.

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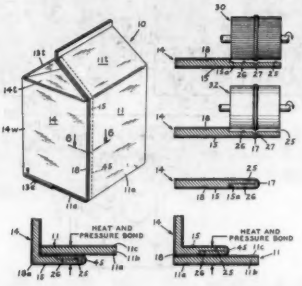
**3,654,842**

**METHOD OF MAKING SIDE SEAM SEALED CONTAINER**

**William E. Schwenk, Norristown, Pa., assignor to International Paper Company, New York, N.Y.**

**Filed Oct. 13, 1969, Ser. No. 865,592**
**Int. Cl. B31b *1/22, 1/64*; B31c *5/00***
**U.S. Cl. 93—94 PS** **1 Claim**




A container for packaging fluids is made from a scored folded blank of coated paperboard. The container is made resistant to leakage by preventing the uncoated edge of a side sealing panel from taking up fluid. This edge is protected by skiving a strip adjacent to the edge of the sealing panel, skiving a narrow region in the center of the skived face into a square-topped notch, scoring the center of the notch and folding the strip on the scoring so that the skived faces are in intimate contact with each other. If the skived strip becomes unfolded, it may be refolded by means of a rounded wedge. The container is then seam sealed.

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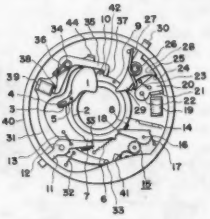
**3,654,843**

**AUTOMATIC FLASH CAMERA**

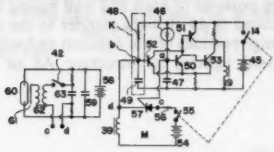
**Hiroshi Ueda, Nara, and Motonobu Matsuda, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha**

**Filed Feb. 11, 1970, Ser. No. 10,424**
**Claims priority, application Japan, Feb. 24, 1969, 44/13707**
**Int. Cl. G03b *7/08, 7/16, 15/05***
**U.S. Cl. 95—10 CE** **6 Claims**



A mechanism for switching from daylight to flash photography and for automatically adjusting the diaphragm aperture to an opening determined by the focusing mechanism. Both the diaphragm aperture and focusing settings are obtained from respective rotating members with a lever riding on a cammed surface of the focusing means and a stop lever mechanism having an angular position determined by the

setting of the focusing mechanism. When the brightness of the object is lower than a threshold level, an electromagnet is



actuated to cause the stop lever to engage a protrusion on the diaphragm adjustment means thereby stopping the aperture at a setting determined by the focus.

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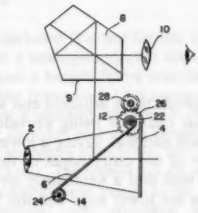
3,654,844

## REFLEX CAMERA APPARATUS

Robert W. Hampton, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed June 4, 1970, Ser. No. 43,525
Int. Cl. G03b 19/12
U.S. Cl. 95—42 6 Claims



A flexible mirror in a reflex camera is normally positioned in the optical path of the camera lens to reflect a scene image to the viewfinder, and is displaced from the optical path to permit the scene image to be formed in the exposure plane by being moved into a non-viewing position when the shutter is released, wherein the mirror is in a rolled configuration.

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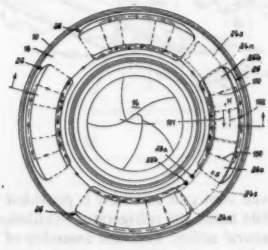
3,654,845

## PHOTOGRAPHIC SHUTTER WITH ELECTRO-MAGNETIC DRIVE MEANS

Paul Fahlenberg, Baierbrunn, and Wilhelm Pross, Munich both of Germany, assignors to Compur-Werk Gesellschaft mit beschrankter Haftung & Co., Munich, Germany

Filed Mar. 30, 1970, Ser. No. 22,351
Claims priority, application Germany, Apr. 28, 1969, G 69 17 120.6
Int. Cl. G03b 9/08
U.S. Cl. 95—53 EB 10 Claims



A photographic shutter having a shutter blade drive ring provided with magnetic coils disposed in the magnetic field of a magnet which is fixed in the housing. When the coils are energized, they react with the magnetic field of the magnet to cause the drive ring to turn, to open and close the shutter blades. An electronic circuit provides the pulses which energize the coils to operate the shutter.

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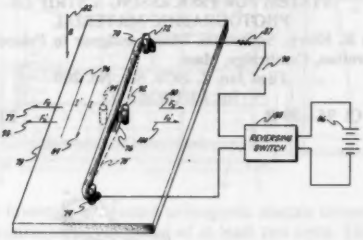
3,654,846

## ELECTRO-MECHANICAL SHUTTER ARRAY

Robert E. Wernikoff, Belmont; David M. Perozek, Watertown, and Jana M. Roten, Brookline, all of Mass., assignors to Electronic Image Systems Corporation, Cambridge, Mass.

Filed Apr. 1, 1970, Ser. No. 24,715
Int. Cl. G03b 9/08
U.S. Cl. 95—53 E 13 Claims




An electromagnetically driven mechanical shutter including a conductor element in a magnetic field for enabling the element to be moved laterally between first and second predetermined positions as a function of the current through the element, means, associated with the element, for introducing current therethrough and stop means associated with the element and adjacent one or both of the positions for positively establishing one or both of the positions of the element. A plurality of such shutters may be included in a linear array which may be combined with a source of radiation to be gated by the shutters to expose a photosensitive material to be printed upon and further combined with photosensitive means for sensing radiation from an object carrying information to be read.

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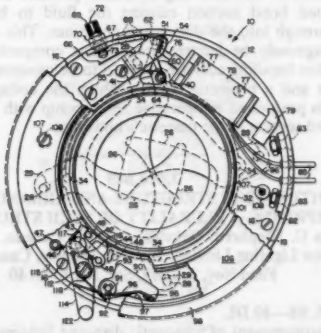
3,654,847

## ELECTRICALLY OPERATED SHUTTER MECHANISM FOR CAMERA

Joseph E. Schwartz, Irondequoit, N.Y., assignor to Victronic, Inc., Victor, N.Y.

Filed Apr. 21, 1970, Ser. No. 30,493
Int. Cl. G03b 9/24
U.S. Cl. 95—63 14 Claims



This mechanism comprises a housing containing overlapping shutter blades, which are pivoted between open and

closed positions by an oscillatable ring that is spring-loaded to a blade-closing position. The ring is connected by a flexible arm to the armature of a solenoid, which is mounted in the housing to be pulse energized momentarily to advance its armature in a direction to cause the flexible arm to rotate the ring to open the shutter blades. An adjustable aperture stop is engagable with a pin on the ring to limit the extent of its rotation and therefore the size of the shutter opening. Each time the solenoid is energized its armature advances far enough to close a switch for controlling a flash attachment. The blades can be held open for focusing by a cam latch which can be released manually or by operation of the solenoid.

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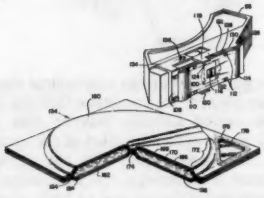
**3,654,848**

**SYSTEM FOR PROCESSING A STRIP OF PHOTOGRAPHIC MATERIAL**

**John R. Sharp, Squantum, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

**Filed Jan. 2, 1970, Ser. No. 209**
**Int. Cl. G03d** *5/02*
**U.S. Cl. 95—89 R** **23 Claims**



Motion picture film processing system employing a dispensing container adapted to express processing fluid onto a strip of exposed film as the film is progressively drawn thereacross. A pair of sheet materials are bonded together to define a substantially flat circular cavity in which a processing fluid is initially stored. A bond is further formed between these materials extending radially of the cavity while a section of the peripheral bond adjacent thereto is weaker than the other sections of the peripheral bond. This weakened bond section is connected to the dispensing container. Thus, when a force applying member is rotated around this collapsible container in a circular path, the radially extending bond acts as a weir to resist movement of the fluid therein. The resulting hydraulic pressure ruptures the weakened bond section causing the fluid to be expelled therethrough into the dispensing container. This system can advantageously be incorporated into a compact, multipurpose, film handling cassette adapted to be mounted in both a camera and a projector and in which the collapsible container is positioned in operative relationship with a rotatably mounted section of the cassette's housing.

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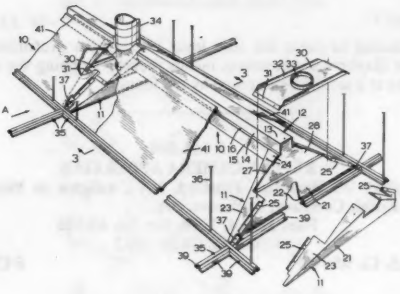
**3,654,849**

**LIGHTING UNIT STRUCTURE AND ARRANGEMENT COMPRISING A PLURALITY OF SUCH STRUCTURES**

**Charles G. Shepherd, Oakville, Ontario, Canada, assignor to Wilson Lighting Limited, Toronto, Ontario, Canada**

**Filed Nov. 6, 1969, Ser. No. 874,140**
**Int. Cl. F21s** *3/14*
**U.S. Cl. 98—40 DL** **7 Claims**

An arrangement of adjacently disposed lighting unit structures in which in each structure a member comprising part of a lighting element rigidly interconnects spaced end walls, the lighting element including a fluorescent lighting lamp or lamps which are supported by the member. Each end wall includes an inner wall portion together with side flange portions which project outwardly from the inner wall portion, the side flange portions of each end wall having outer edges which are secured in an air-tight manner to the outer edges of the side flange portions of the adjacent end wall of the adjacently disposed, lighting unit structure. An air chamber is



thus provided between these adjacent end walls, a ventilation air inlet to the air chamber being provided, and the inner wall portion of each end wall having a lower edge which is so disposed inwardly of the outer edges of the side flange portions of the end wall that a ventilation air outlet is thereby provided between the lower edge and the lower edge of the inner wall portion of the adjacent end wall of the adjacently disposed lighting unit structure.

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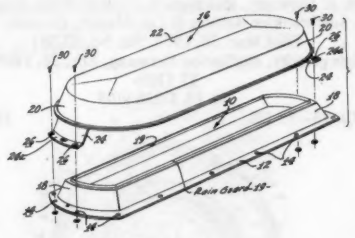
**3,654,850**

**VENT UNIT**

**Clyde C. Berkus, Encino, Calif., assignor to Diversified Designs Services, Mission Hills, Calif., a part interest**

**Filed Aug. 26, 1970, Ser. No. 66,968**
**Int. Cl. F23l** *17/02*
**U.S. Cl. 98—61** **2 Claims**



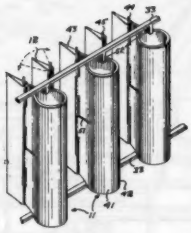
An improved vent unit assembly is provided for particular use in a mobile home gas refrigerator ventilation system, but which has general utility. The vent assembly of the invention is of a two-piece construction, each of the components of which may be nested with other like components for compact packaging when shipping, and for ease of dismantling when cleaning the ventilation system in which the assembly is incorporated.

3,654,851

## DIFFUSERS FOR CONDITIONED AIR CONDUITS

Mannie Bertin, 110 Revere Street, Portland, Maine, and Ira L. Bertin, Box 56, Limington, Maine

Filed Apr. 8, 1970, Ser. No. 26,613
Int. Cl. F24f *13/10*
U.S. Cl. 98—110 21 Claims



Diffusers are disclosed that are for use in distributing conditioned air from a ceiling-supported conduit. Each diffuser has side frames and a hanger frame attachable to the ceiling, the conduit, or the framework of a suspended ceiling. Each side frame carries a plurality of damper-fin units, each unit having a pair of dampers and a fin mounted on a common pivot to be independently adjustable, the dampers being internally of the diffuser. The frames are shown as formed from extruded stock enabling side frames to be joined at right angles or in alignment and providing marginal portions establishing a panel-supporting frame.

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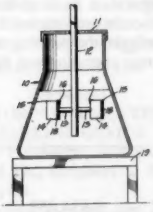
3,654,852

## APPARATUS AND METHOD FOR EXTRACTING THE ESSENCE FROM A FOOD SUBSTANCE BY CONTROLLED AGITATION

Jose Rosan, Sr., Rancho San Juan, San Juan Capistrano, Calif.

Continuation-in-part of application Ser. No. 675,736, Aug. 23, 1967, now abandoned. This application Apr. 22, 1970, Ser. No. 30,771
Int. Cl. A47j *17/62*
U.S. Cl. 99—323 9 Claims



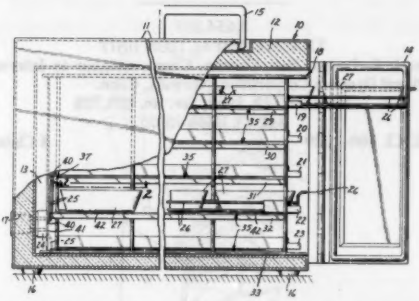
This invention relates to an apparatus and method for extracting the essence from a food substance such as coffee by placing the food substance in a porous basket, bag or other porous container and agitating the same in an ambient liquid.

3,654,853

## MAGNETIC ELECTRICAL CONNECTOR FOR A FOOD PREPARATION SYSTEM

Richard E. Fayling, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 14, 1968, Ser. No. 775,625
Int. Cl. A23l *3/00*
U.S. Cl. 99—359 2 Claims



This invention is directed to magnetic electric connectors. Each connector is composed of at least two units. The first unit is comprised of a nonconductive permanent magnet partially encased by electrically conductive contact plates bonded or form fitted to the magnet. The second unit may be of similar construction or conversely comprise a magnetically permeable electrically conductive platen of desired configuration. When connected, the contact plates of two similar units or the contact plates of one unit and the magnetically permeable platen contact each other and act as electrical conductors. The units are held together by magnetic attraction. The juncture of the plates or the platen and plates forms an electrically conductive connection so that current from a power source connected to one unit can pass to a load connected to the other unit. Either or both units can be integrally formed with electrical appliances, devices, etc.

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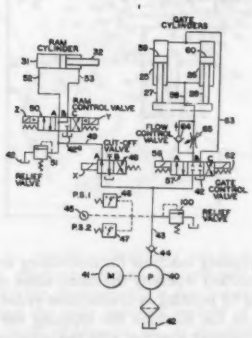
3,654,854

## REFUSE PACKER

Kenneth L. Cook, Uhrichsville, and Thomas R. McCartney, New Philadelphia, both of Ohio, assignors to Uhrden, Inc., Sugarcreek, Ohio

Filed Feb. 4, 1970, Ser. No. 8,551
Int. Cl. B30b *15/16*
U.S. Cl. 100—52 6 Claims



An automatic cycling refuse packer and its method of operation are provided. The packer includes an elongate

receptacle with a discharge end and a gate operably attached to the discharge end for movement to and from closing and opening positions. A ram and hydraulic cylinder assembly is provided within the receptacle and controls axial movement of a ram plate extending transversely of the receptacle. Pressure actuated control means and an electrical control circuit control the automatic cycle of the ram for moving the ram plate towards the gate, raising the gate, moving the ram forwardly at a high pressure and ultimately retracting the ram and lowering the gate.

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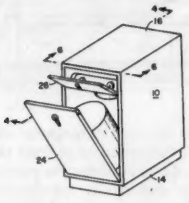
**3,654,855**
**TRASH COMPACTION UNIT**
**Joseph F. Longo, New Canaan, Conn., assignor to International Dynetics Corporation, Norwalk, Conn.**
**Filed Dec. 29, 1969, Ser. No. 888,788**
**Int. Cl. B30b** *15/06*
**U.S. Cl. 100—229** **8 Claims**



A household compaction unit having a receptacle for collection of trash and a hydraulic ram operated by household water supply to compact said garbage.

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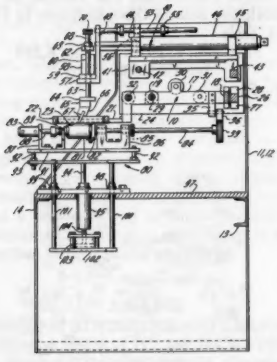
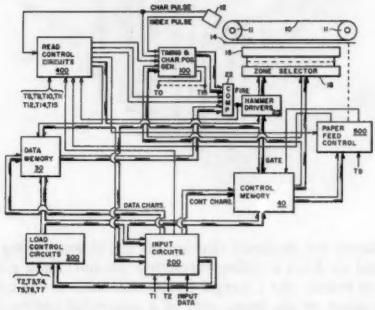
**3,654,856**
**SCREEN PRINTING MACHINE FOR DECORATING MULTI-SIDED ARTICLES**
**Thomas W. Olsen, Wayne, N.J., assignor to Modern Decorating Company, Passaic County, N.J.**
**Filed June 6, 1969, Ser. No. 831,068**
**Int. Cl. B41f** *17/24;* **B41l** *13/00*
**U.S. Cl. 101—40** **11 Claims**



A screen printing machine for decorating articles having a rectangular section whereby the three sides of such articles are decorated by printing in consecutive order in one setting. Mechanisms in the machine for indexing the articles to be decorated in register together with the printing screen which carries the indicia to be printed on the three of the four sides of the articles in side-by-side relationship.

**3,654,857**
**PRINTER HAVING FEWER HAMMER ACTUATING MEANS THAN HAMMERS**
**Lynn W. Marsh, Jr., Melrose, Mass., assignor to Mohawk Data Sciences Corporation, East Herkimer, N.Y.**
**Original application Oct. 16, 1967, Ser. No. 675,483. Divided and this application June 16, 1969, Ser. No. 843,271**
**Int. Cl. B41j** *9/10*
**U.S. Cl. 101—93 C** **3 Claims**




A telecommunications line-printer employs a segmented line print control and data buffering system wherein the serially received data and format control characters are temporarily stored in data groups corresponding to segments of a print line. Each group is scanned during printout operations until all data in the group have been printed. A switching matrix connects hammer driver circuits only to hammers in the line segment being printed, thus conserving hardware by time-sharing the drivers. Each data group has a control character defining format control operations, which operations are executed before printing of the group begins. In ordinary circumstances, each format control character occurring at the input opens a new data group to receive the next data characters, regardless of whether the previous group was completely filled. However, in "short line" situations memory is conserved by not closing the group until it is full and the rate of extraction of data from the memory is increased by temporarily suspending the performance of format operations. This preserves real time printing while insuring against loss of input data. In short line situations, received format control characters are ignored by the format control means and instead trigger the printing of a special character indicating that a format operation was deleted.

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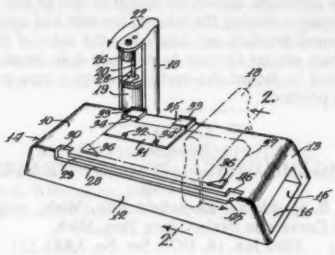
**3,654,858**
**TRAVELING CYLINDER PRINTER WITH TILTING CARRIAGE RETAINED IN A SLOT IN THE BASE**
**Lawrence B. Rick, 1131 Pfingsten Road, Glenview, Ill.**
**Filed Apr. 16, 1970, Ser. No. 29,066**
**Int. Cl. B41f** *3/20*
**U.S. Cl. 101—269** **2 Claims**

A device for imprinting documents by means of portable printing plates which can be of different sizes, and having a

manually movable carriage which is pivotally mounted for operative engagement over and for permitting it to be swung



away from the bed which supports the printing plate and the documents to be imprinted thereby.

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**3,654,859**

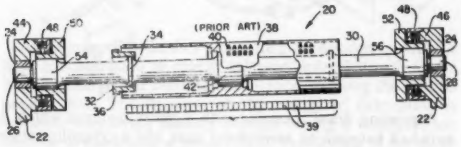
**INTERMITTENT MOTION DEVICE FOR HIGH-SPEED ROTATING PRINT DRUMS**

**William S. Touchman, Kettering, Ohio, assignor to The National Cash Register Company, Dayton, Ohio**

**Filed Jan. 19, 1970, Ser. No. 3,690**

**Int. Cl. B41j** *1/34;* **B23p** *11/02;* **E03b** *1/00*

**U.S. Cl. 101—93 C** **21 Claims**




An intermittent, rotary motion mechanism which operates at the resonant frequency of its rotating system. The rotating system includes an input member, at least first and second output members (like first and second printer drums in a high-speed printer), and a resilient member (like a torsion shaft) interconnecting the first and second drums. An exciter (like a magnetic oscillator) is used to start the rotating system and keeping it oscillating at its resonant frequency to cause the first and second printer drums to dwell a predetermined number of times for each complete revolution of the input member as the input member is rotated at a constant velocity. The first printer drum experiences a dwell at a time when the second printer drum is rotating at substantially twice the velocity of the input member. More than two output members are utilized in other embodiments.

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**3,654,860**

**POSITION INDICATOR FOR A MULTIPLE CHARACTER MARKING DEVICE**

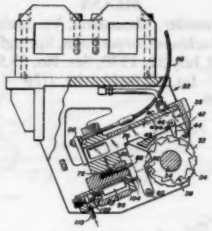
**Edwin W. Speicher, Pittsburgh, and Charles E. Fry, Jr., Coraopolis, both of Pa., assignors to M. E. Cunningham Company, Ingomar, Pa.**

**Original application Oct. 21, 1968, Ser. No. 749,112, now Patent No. 3,541,954, dated Nov. 24, 1970. Divided and this application Aug. 10, 1970, Ser. No. 62,299**

**Int. Cl. B41j** *1/54;* **B44b** *5/00*

**U.S. Cl. 101—110** **5 Claims**

This disclosure relates to a marking device with a plurality of marking wheels for marking slabs, billets or the like with a group of characters. Each marking wheel has a plurality of characters on the outer periphery and character selection is accomplished by rotating the marking wheel until the desired character on the wheel periphery is in marking position. Each wheel has a ratchet on one side that is actuated by a pawl connected to an actuating slide. The pawl on the actuating slide engages a segment of the ratchet and rotates the marking wheel for character selection. On the other side of the wheel there is a spiral cam with different preselected radial dimensions for each of the characters. A linear transducer is biased against the cam surface and generates a voltage signal that is proportional to the radial dimension of the



portion of the cam aligned with the transducer to thus indicate the particular character in the marking position. The voltage signal from the transducer is compared with fixed reference voltages and when the voltages match, a relay is actuated to indicate the character on the wheel in marking position. The circuitry includes a logic section to count sequentially so that a transducer malfunction at the steeply sloping portion of the cam between the longest and shortest dimension of the cam cannot produce an incorrect character indication.

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**3,654,861**

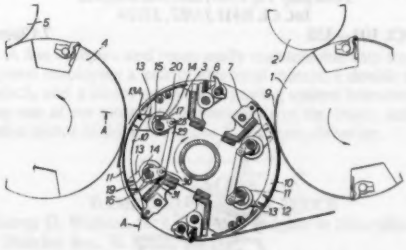
**SHEET CARRIER CYLINDER FOR USE IN A POLYCHROME ROTARY PRINTING PRESS ADAPTED FOR BOTH ONE-SIDE AND TWO-SIDE PRINTING**

**Otfried Rudolph, Dresden, and Wilfried Kuhn, Radebeul, both of Germany, assignors to Veb Druckmaschinenwerk Planeta, Radebeul, Germany**

**Filed Apr. 6, 1970, Ser. No. 25,765**

**Int. Cl. B41f** *7/06, 21/06*

**U.S. Cl. 101—183** **4 Claims**



Sheet guide or transfer cylinder for use in a polychrome rotary printing machine adapted for one-side or two-side printing, in which the sheet printed in the first printing device is pressed against the solid jacketed surface of the printing cylinder at the point of tangent, i.e., at the point of contact between the sheet guide or transfer cylinder and the printing cylinder arranged before it, in the direction of movement, by directing and carrier elements arranged on the sheet guide or

transfer cylinder, and is securely carried thereby until the suction means disposed on the sheet guide or transfer cylinder grasp the end of the sheet and lift it off from the cylinder. The directing and carrier elements are arranged on the periphery of the sheet guide or transfer cylinder so as to be radially movable, whereby they permit crease-free transfer of the sheet to a further printing device.

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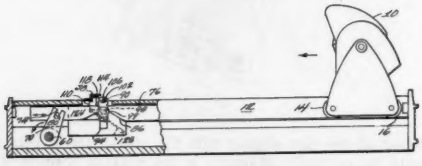
**3,654,862**

**TRAVELING CYLINDER PRINTER WITH PLATEN MOVEMENT RESPONSIVE DOCUMENT CLAMPING MEANS**

**Heinz F. Strohschneider, Alexandria, Va., assignor to Farrington Business Machines Corporation, Springfield, Va.**

**Filed July 31, 1970, Ser. No. 59,950**
**Int. Cl. B41f** *3/20, 1/28*
**U.S. Cl. 101—269** **8 Claims**



Document holding apparatus for use with an imprinting device having two document guides disposed on the print bed and two openings in the print bed under the document guides. Operative through the two openings are two document holding means which are lowered when the imprinting head is in its rest position. Actuator means are responsive to the imprinting head when it is in its rest position to lower the document holding means to thereby permit insertion of the document into the document guides. In response to the imprinting head being moved from its rest position, the actuator means raises the document holding means so that it presses the document against the document guides and stretches it therebetween to hold the document in position as the printing operation is effected.

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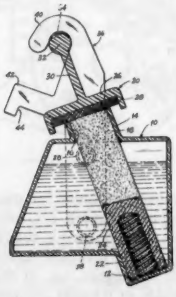
**3,654,863**

**INKING CARTRIDGE FOR TAPE CODER**

**Forrest G. Hill, East St. Louis, and Samuel H. Kelly, Belleville, both of Ill., assignors to Marsh Stencil Machine Company, Belleville, Ill.**

**Filed July 11, 1969, Ser. No. 840,955**
**Int. Cl. B41f** *31/02, 31/24*
**U.S. Cl. 101—335** **7 Claims**



The novel inking cartridge for tape coders disclosed includes a plastic bottle or container for ink. A felt wick-type ink pad of rectangular configuration is disposed in the container and extends through a suitable opening provided in the latter, a cap for the container opening sealing the ink pad within the container against the action of spaced coil springs in the container biasing the ink pad towards and against the cap. Opposed brackets are secured to the sides of the container which engage the cap to maintain it in position, and are adapted to mount the cartridge upon a tape coder in operative position.

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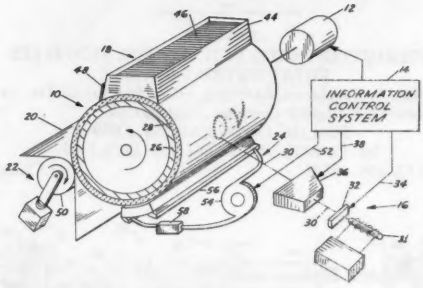
**3,654,864**

**PRINTING EMPLOYING MATERIALS WITH VARIABLE VOLUME**

**Stanford R. Ovshinsky, Bloomfield Hills, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.**

**Filed Jan. 16, 1970, Ser. No. 3,453**
**Int. Cl. B41n** *1/00*
**U.S. Cl. 101—426** **6 Claims**




A printing drum is coated with a glassy material which is switched between an amorphous state and a crystalline state by the application of a laser beam. The coating occupies less volume in the crystalline state than in the amorphous state. In one mode of operation the coating is initially in the amorphous condition and is selectively switched into the crystalline condition at discrete locations by writing thereon with a laser beam. The crystalline areas form depressions which are filled with ink. A doctor blade cleans the surface of the coating leaving ink in the depressions for printing. In another mode of operation the coating is initially in a crystalline or more ordered condition and the laser beam switches it to an amorphous or disordered condition thereby raising the surface of the coating at the points where the laser beam strikes the coating. A pressure sensitive paper is rolled against the coating and an image appears on the paper corresponding to the pattern of peaks formed on the coating. The depressions and peaks on the coating are erased by reapplication of the laser at a different energy level.

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**3,654,865**

**METHOD FOR FORMING DYE IMAGE USING AN ELECTROPHOTOGRAPHIC DEVELOPER CONTAINING A GELATIN TONER**

**Yasuo Tamai, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Feb. 5, 1970, Ser. No. 9,077**
**Claims priority, application Japan, Feb. 5, 1969, 44/8518**
**Int. Cl. B41m** *5/06*
**U.S. Cl. 101—463** **3 Claims**

A color printing process which comprises the steps of (1) processing with an acid an electrophotographic sensitive layer of a photoconductor mainly consisting of photoconductive zinc oxide, the layer having a gelatin image prepared by forming an electrostatic latent image on the layer and then converting the latent image into the gelatin layer by processing with an electrophotographic developer containing

fine particles of gelatin, whereby the zinc oxide contained in the electrophotographic sensitive layer is removed, (2) bringing the gelatin layer into contact with a solution of a dye in a solvent mainly consisting of water to provide the dye to the gelatin image, (3) rinsing the layer with acid water to remove the excessive solution of the dye wetting the gelatin image, whereby the dye is once insolubilized, and (4) bringing the dyed gelatin image into contact with a layer capable of being readily dyed by the dye to transfer the dye onto the layer.

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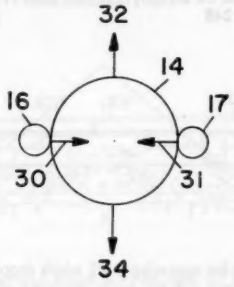
**3,654,866**
**MACH EFFECT IN PRESPLITTING**
**Fred A. Fritz, Hockessin, Del., assignor to Hercules Incorporated, Wilmington, Del.**
**Filed June 18, 1970, Ser. No. 47,507**
**Int. Cl. F42d** *1/04, 3/04*
**U.S. Cl. 102—23** **10 Claims**




An improved method of presplitting is provided in which a high concentration of energy released upon detonation of a blasting charge in a blasting hole is focused along the desired presplit line. The focusing of the energy of detonation is achieved employing blasting charges having a configuration capable of producing a Mach Effect. Positioning of the blasting charges in the blasting holes permits the concentration of energy to be focused along the desired presplit line.

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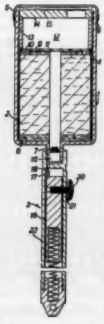
**3,654,867**
**PYROTECHNIC DEVICES**
**Dudley Charles Murray, Homington, near Salisbury, England, assignor to Pains-Wessex Limited, Salisbury, England**
**Filed May 19, 1969, Ser. No. 825,794**
**Claims priority, application Great Britain, July 2, 1968, 31,598/68**
**Int. Cl. C06d** *1/10*
**U.S. Cl. 102—37.4** **9 Claims**



A signal device comprising signal composition which is housed within a casing and which remains therein during combustion and a firing device which releasably engages the casing and which can be hand-held during the combustion of the composition.

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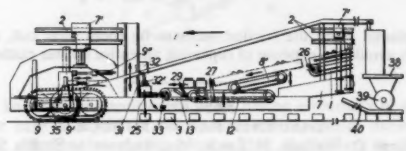
**3,654,868**
**MOBILE TRACK MAINTENANCE APPARATUS**
**Franz Plasser, and Josef Theurer, both of Johannesgasse 3, 1010 Vienna, Austria**
**Filed Oct. 7, 1969, Ser. No. 864,384**
**Claims priority, application Austria, Oct. 16, 1968, 10089/68**
**Int. Cl. E01b** *37/00*
**U.S. Cl. 104—2** **12 Claims**



In a mobile track laying apparatus, the forward end of an overhanging portion of a support frame is supported on a full-track running gear extending in the direction of track elongation. The support frame bridges the location where the new ties are laid and supports a plurality of mechanisms for transporting the new ties to this location.

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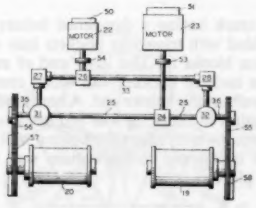
**3,654,869**
**SHIP TRANSFER SYSTEM**
**Alexander Lehrer, Alexandria, Va., assignor to Litten Systems, Inc., College Park, Md.**
**Filed July 27, 1970, Ser. No. 58,455**
**Int. Cl. B65g** *67/58*
**U.S. Cl. 104—114** **7 Claims**




A less complex and more easily maintainable ship transfer system employing a pair of electrical motors, a double drum winch, and a direct mechanical gearing system interconnecting one of the motors to oppositely drive the drums, and the other motor to drive the drums in the same direction.

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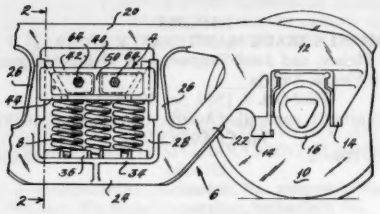
**3,654,870**
**DAMPENED RAILWAY TRUCK**
**George O. Wallace, St. Louis, Mo., assignor to Diversified Industries, Inc., St. Louis, Mo.**
**Filed Apr. 29, 1970, Ser. No. 32,813**
**Int. Cl. B61f** *5/06, 5/12, 5/50*
**U.S. Cl. 105—197 DB** **18 Claims**

A railway truck dampened bolster which at its ends is provided with laterally opening sockets into which replaceable bearing blocks are fitted. These bearing blocks bear against wedge-shaped friction blocks which snub the movement of the bolster relative to the side frames in which it is mounted. The bearing blocks may be spring biased outwardly s that they are always firmly engaged with the wedge-shaped fric-

tion blocks, thus enabling the friction blocks to provide the snubbing effect even at light car loads. The blocks are easily



replaced when the friction surfaces on them wear out, and this avoids the expense of replacing an entire bolster casting.

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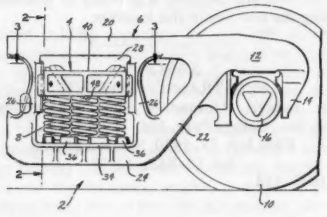
**3,654,871**
**DAMPENED RAILWAY TRUCK**
**George O. Wallace, St. Louis, Mo., assignor to Scullin Steel Company, St. Louis, Mo.**
**Filed May 4, 1970, Ser. No. 34,326**
**Int. Cl. B61f** *5/06, 5/12, 5/50*
**U.S. Cl. 105—197 DB** **12 Claims**



A railway truck having a dampened bolster which at its ends is provided with triangular pockets into which wedge-shaped friction blocks fit. The inner end of each pocket is defined by an inclined backing wall which connects the top and bottom walls at the bolster end. A hardened wear plate is positioned against the backing wall and has a tab at its lower end which turns inwardly along the bottom wall of the bolster end. The tab is fastened to the bottom wall to secure the wear plate in place.

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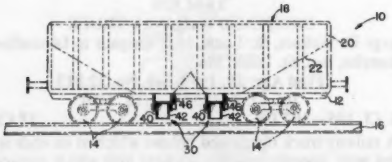
**3,654,872**
**RAILWAY HOPPER CAR PIVOTED CLOSURE CHUTE**
**Joseph G. Fearon, Libby, Mont., assignor to Morrison-Knudsen Company, Inc., Boise, Idaho**
**Filed May 11, 1970, Ser. No. 35,977**
**Int. Cl. B61d** *7/06, 7/18, 7/26*
**U.S. Cl. 105—239** **3 Claims**



Ballast is distributed in controlled amounts between or outside parallel rails of a railroad from a railway ballast or hopper car having discharge openings in the lower end of each of the hoppers. Discharge control members, in their normal position, cover each of the discharge openings of the ballast car hoppers. The discharge control members are pivotally supported from the car body for rotation about pivot points directly above each rail. When the discharge control members are rotated in one direction ballast is distributed between the rails. When rotated in the opposite direction ballast is discharged outside the rails. The amount of ballast discharged is controlled by the degree of rotation of the discharge control members.

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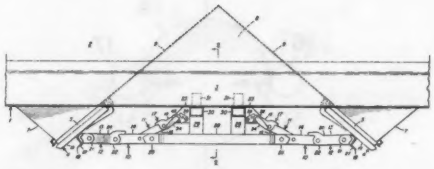
**3,654,873**
**TANDEM TOGGLE HOPPER DOOR OPERATING MECHANISMS**
**Walter L. Floehr, Toledo, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio**
**Filed Apr. 20, 1970, Ser. No. 30,116**
**Int. Cl. B61d** *7/18, 7/26;* **E05f** *11/28*
**U.S. Cl. 105—248** **8 Claims**



Mechanism for operating a full width drop bottom door of a sill-less hopper car for quick dumping of bulk lading by swinging the door in opening beyond the vertical to a positively stopped open position. The mechanism has as a drive linkage a toggle connected between the door and the car body and a lever fulcrummed on the body and so linked to an adjoining arm of the toggle as to swing through a lesser arc than the door. In closed position the toggle and the lever and its link are both substantially fully extended and over-center for providing a double tandem lock against opening of the door and a locking device connected to an automatically releasing capstan on the operating shaft of the lever enables the operating mechanism to be locked in either open or closed position.

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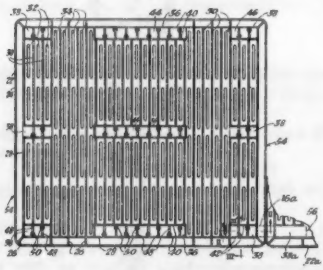
**3,654,874**
**PALLET CONSTRUCTIONS**
**Harvey G. Skinner, Ligonier, Pa., assignor to Vulcan, Inc., Latrobe, Pa.**
**Filed Apr. 28, 1970, Ser. No. 32,544**
**Int. Cl. B65d** *19/18*
**U.S. Cl. 108—51** **15 Claims**



A pallet construction comprising a prefabricated pallet component having transverse stiffening means, a plurality of

longitudinally extending support member engagement means formed on said pallet component, each of said engagement means including a pair of spaced extensions disposed for substantially flush engagement with an associated support member, support members inserted between each pair of said extensions, and fastening means for securing said pallet component to each of said support members at said engagement means.

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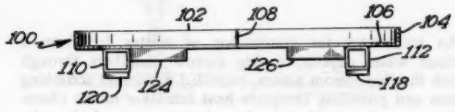
**3,654,875**
**PALLET FOR HANDLING SHIPPING DRUMS**
**Albam M. Vik, New Brighton, Minn., assignor to Inventors Engineering Inc., Fridley, Minn.**
**Continuation of application Ser. No. 698,898, Jan. 18, 1968, now abandoned , which is a continuation-in-part of application Ser. No. 673,609, Oct. 9, 1967, now Patent No. 3,521,771. This application Oct. 28, 1969, Ser. No. 871,983**
**Int. Cl. B65d** *19/44*
**U.S. Cl. 108—51** **4 Claims**




A pallet is described which is to be used for handling and transporting shipping drums, such as fiber drums, steel drums or barrels by fastening the pallet to the base of the drum. The pallet is of just sufficient size to accommodate a single drum. The drum is filled and transported while maintaining it secured to the pallet at all times. The pallet includes a circular extension, comprising a ring of strip material adapted to fit telescopically over the lower end of the drum and a plurality of horizontally disposed legs fastened rigidly to the ring.

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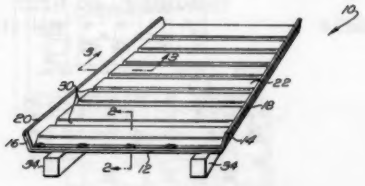
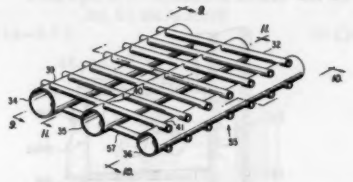
**3,654,876**
**PALLET**
**Horst J. Achs, Prospect Heights, Ill., assignor to Eaton Corporation, Cleveland, Ohio**
**Filed Dec. 11, 1969, Ser. No. 884,293**
**Int. Cl. B65d** *19/18*
**U.S. Cl. 108—51** **2 Claims**




A pallet for supporting material thereon includes a base having a substantially flat portion of a rectangular shape lying in a plane. The pallet has two opposing sides extending in one direction from the plane and forming flange portions for retaining the material supported by the pallet. The pallet also includes a reinforcing member secured to the base and which strengthens the pallet and provides a surface for supporting the material carried by the pallet.

**3,654,877**
**KNOCKDOWN WAREHOUSE PALLET**
**Lawrence G. Barrett, Lynchburg, Va., assignor to The American Novawood Corporation, Lynchburg, Va.**
**Filed May 16, 1969, Ser. No. 825,310**
**Int. Cl. B65d** *19/18*
**U.S. Cl. 108—56** **7 Claims**



A knockdown warehousing pallet having a plurality of tubular base members of progressive cross-sectional dimensions suitable for nesting one within the other in the knockdown condition and a plurality of load supporting tubular members which extend in the assembled pallet condition normally across and which are partially received within the base members. The load supporting members and base members may be attached to each other by dowel pins, and all the parts may be inserted in the largest tubular member, which may have end caps, for storage or easy transport.

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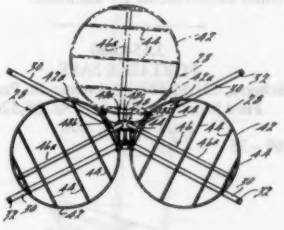
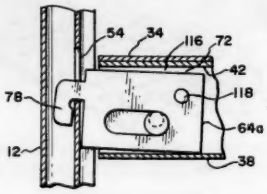
**3,654,878**
**DISC PACK STORAGE APPARATUS**
**Boris M. Osojnak, Birmingham, Mich., assignor to Engineered Data Products, Inc., Ferndale, Mich.**
**Filed Dec. 29, 1969, Ser. No. 888,309**
**Int. Cl. A47b** *11/00*
**U.S. Cl. 108—103** **8 Claims**



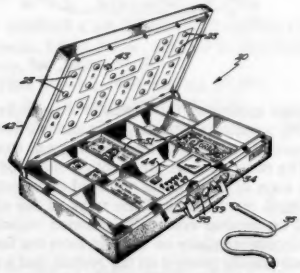
A storage apparatus, for computer disc packs or the like, comprising a central upstanding post and two vertical rows of trays mounted on the post for receiving and storing the disc packs. The two tray rows are pivotally mounted on the post with the trays of one row all mounted on essentially a common vertical pivot axis and the trays of the other row all mounted on another essentially common vertical pivot axis spaced circumferentially on the post from the first axis. Each tray is individually pivoted on the post so that a selected tray from either row may be pivoted into the circumferential space between the rows to provide access to the disc pack on that tray. A gang cord interconnects the trays of each row and operates to permit displacement of only one tray at a time from that row into the circumferential access space with the displaced tray being automatically returned to its stored position in the row in response to movement of another tray of that row into the circumferential access space.

3,654,879
**TWIST CAM LOCK FOR KNOCKDOWN SHELVING**
Irwin J. Ferdinand, Glencoe, and Irwin R. Kulbersh, Morton Grove, both of Ill., assignors to The Hirsh Company, Skokie, Ill.
Filed Apr. 16, 1970, Ser. No. 29,029
Int. Cl. A47b *47/02*
U.S. Cl. 108—110 2 Claims



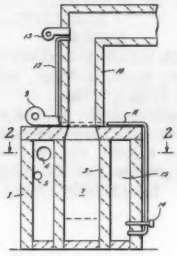

Knockdown steel shelving is disclosed wherein each corner of a shelf is provided with a slidably mounted hook member that extends into the cut-out corner of the shelf. The hook members are guided within the box flange for retraction to clear an upright support member for level adjustment and for extension to a position for engagement within an opening in an upright support member and then tightened to a retracted position by a cam whereby the shelf corner and support are brought into rigid, weight-supporting relationship. The cam operates within a slot in the hook member and can have one of several locked positions including a position wherein the cam is rotated so that the lobe retracts the hook member into a locked position with a bottom edge of the hook member against the bottom wall of the box flange or with a top edge of the hook member against the top wall of the box flange. In either position, the cam may lock at a side-dead-center position in relation to the other parts. The hook attaching means and cam are essentially concealed, easily installed and adapted for use with various designs of shelves and corner supports. Other embodiments are disclosed.

3,654,880
**PORTABLE SAFE**
Leroy R. Schesso, 821 Minnesota Avenue, St. Paul, Minn.
Filed Nov. 10, 1970, Ser. No. 88,326
Int. Cl. E05g *3/00*
U.S. Cl. 109—25 7 Claims



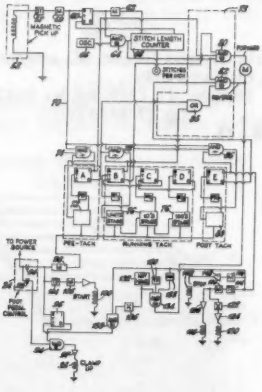
A depository for the storage and/or transport of negotiable papers, including currency, is disclosed, which includes a means for punching at least one hole through the papers by an electrically activated punch in the event the container for the paper is forced open by a thief.

3,654,881
**CYCLONE INCINERATOR**
Harry L. Bowles, Houston, Tex.
Filed May 4, 1970, Ser. No. 34,274
Int. Cl. F23g *5/12*
U.S. Cl. 110—8 C 5 Claims



An incinerator for combustion of wastes fed from a cyclone waste deposit, having narrow chambers through which the flue stream passes, provided maximum scrubbing action and providing complete heat retention in the chambers to complete oxidation of particulate matter before the flue stream enters the stack for emission.

3,654,882
**AUTOMATIC CONTROL SYSTEM FOR SEWING MACHINES**
David H. Kamena, Parsippany, N.J., assignor to Pneumatic Systems Inc., New York, N.Y.
Filed Aug. 11, 1969, Ser. No. 848,998
Int. Cl. D05b *19/00*
U.S. Cl. 112—121.11 9 Claims

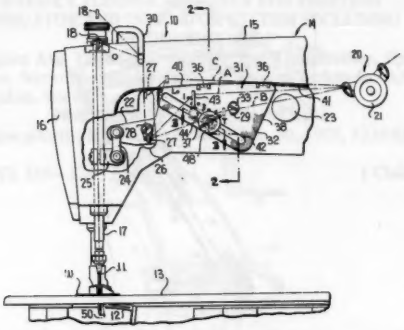


An automated control system for a sewing machine which includes a stepping motor for pulsatingly feeding the work material into the path of the sewing head needle assembly and control means for driving said stepping motor in response to programmed instructions preset by the operator at the outset of the sewing operation. The control means preferably comprises digital logic circuitry which generates control pulses for the stepping motor to govern stitches per inch and back tack.

## 3,654,883
## THREAD CONTROL MECHANISM FOR SEWING MACHINES

George M. Reimer, Elmwood Park, and Frederick M. Klose, Chicago, both of Ill., assignors to Union Special Machine Company, Chicago, Ill.

Filed May 14, 1970, Ser. No. 37,108
Int. Cl. D05b *49/00*
U.S. Cl. 112—245 9 Claims

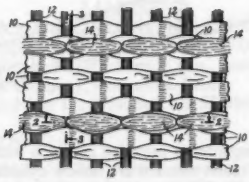


This disclosure relates to a thread control mechanism for sewing machines which will permit the machine operator to adjust the tightness of the stitch in accordance with the requirements of the particular work being sewn. The needle thread control mechanism includes a bracket plate which is conveniently mountable on a conventional sewing machine frame and which has mounted thereon an eyelet assembly for movement along a predetermined path and selected positioning thereof along such path so as to vary the extent of a thread loop which is formed between a thread tensioning device and the needle lever thread eyelet of the sewing machine, thereby controlling the tightness of the stitch being formed.

## 3,654,884
## TUFTED PILE FABRIC

Henry D. Dawbarn, Waynesboro, Va., assignor to Thiokol Chemical Corporation, Bristol, Pa.

Continuation-in-part of application Ser. No. 487,402, Sept. 15, 1965, now abandoned, and 840,594, June 30, 1969, now abandoned, said Ser. No. 840,594 is a continuation of Ser. No. 487402. This application Dec. 11, 1969, Ser. No. 884083
Int. Cl. D05c *17/02*
U.S. Cl. 112—410 6 Claims

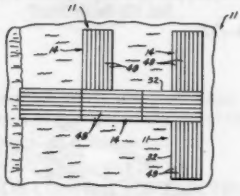


A primary backing adapted to be used in making tufted pile fabrics and woven from polyolefin yarns, the warp yarns being closely spaced flat ribbon monofilaments of substantially rectangular cross-section and the weft yarns being widely spaced relatively round multifilament or monofilament yarns. The warp yarns are crowded together to give a spacing index of 1.3 to 1.6. The weft or filling yarns are preferably untwisted multifilament yarns with a spacing index of 0.15 to 0.45. The tufted backing is also claimed.

## 3,654,885
## FLOATING DOCK SECTION

Byron L. Godbersen, Ida Grove, Iowa

Filed Apr. 6, 1970, Ser. No. 25,810
Int. Cl. B63b *35/00*
U.S. Cl. 114—0.5 F 10 Claims

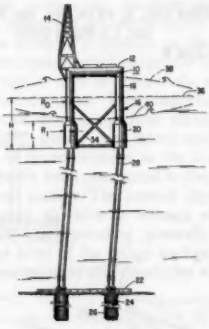


This invention relates to a floating dock section which is rigidly securable to adjacent sections. A first member extends centrally and longitudinally of the dock section and terminates proximate opposite ends of the dock section. Second members mate with the ends of the first members of adjacent sections and secure adjacent sections together. The entire dock is rigid in the water and very stable laterally as the first members distribute torque over the entire dock.

## 3,654,886
## TETHERED PLATFORM FLOTATION

Daniel Silverman, Tulsa, Okla., assignor to Amoco Production Company, Tulsa, Okla.

Filed June 24, 1970, Ser. No. 49,417
Int. Cl. B63b *35/00, 35/44*
U.S. Cl. 114—0.5 D 18 Claims



This invention relates to a structure floating on a body of water. The structure comprises a working deck with buoyancy means supporting the deck. The buoyancy means comprises one or more slender vertical floats which have a unique structure having two parts. The first part comprises a straight, vertical, prismatic volume which runs the entire vertical length of the vertical floats. The volume of the prismatic portion comprises between about 40 and 80 percent of the total displacement. There is a second or auxiliary volume of displacement which is submerged below the trough up the maximum wave to be expected. The relative buoyancy of the two parts can be adjusted so as to minimize the vertical forces on the structure due to passing waves. This invention

is concerned with additional means to vary the flotation of the prismatic part and to control the water plane area of the floats so as to reach smaller minimum variations of vertical forces on the structure.

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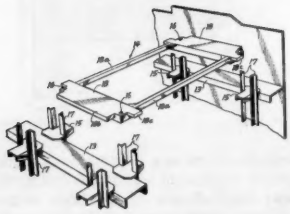
**3,654,887**
**CONTAINER SUPPORTING APPARATUS FOR CONTAINER SHIP**
**Akira Iwami, Tokyo, Japan, assignor to Mitsui Shipbuilding and Engineering Co. Ltd., Tsukiji, Chuoku, Tokyo, Japan**
**Filed Mar. 18, 1970, Ser. No. 20,632**
**Claims priority, application Japan, Mar. 19, 1969, 44/21147**
**Int. Cl. B63b** *25/22*
**U.S. Cl. 114—72** **3 Claims**



Apparatus in a container ship to permit more than the usual limit of six containers to be stacked within each container guideway comprising a removable supporting member operable to span across the guideway and to be supported by supporting structure of the ship outside of the guideway and independently of the angular container guides which define the guideway.

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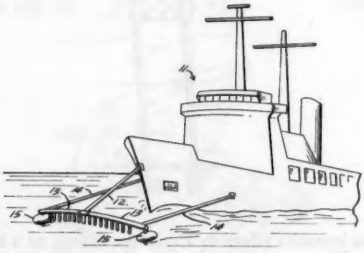
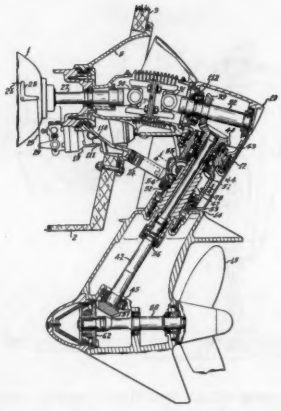
**3,654,888**
**MARINE MINE SELF PROTECTION SYSTEM**
**Roddie F. Bailey, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy**
**Filed Dec. 3, 1970, Ser. No. 94,655**
**Int. Cl. B63g** *9/00*
**U.S. Cl. 114—240 R** **10 Claims**



This invention discloses a guard to protect a ship against floating mines. The invention comprises a rake-like device held in front of the ship. The device is supported by hydrofoils mounted thereon when the ship is underway at moderate speeds and by float means when the ship is at low speeds or stationary. The mine engaging members depend downwardly into the water in front of the ship from a horizontal support member. The mine engaging members and hydrofoil members pivot to produce minimum drag during turning maneuvers.

**3,654,889**
**HYDRAULIC SYSTEM FOR A BOAT DRIVE**
**Karl Abdon Bergstedt, Goteborg, Sweden, assignor to AB Volvo Penta, Gothenburg, Sweden**
**Filed Sept. 28, 1970, Ser. No. 75,909**
**Int. Cl. B63h** *25/42*
**U.S. Cl. 115—35** **8 Claims**



A hydraulic system for steering and tilting an outboard drive unit for a boat including a pump, a steering sub-system including a double acting cylinder and piston connected to provide steering movement to a steerable part of the unit and provided with hydraulic liquid from the pump, and a trimming and tilting sub-system including a cylinder and piston assembly provided with liquid from the steering sub-system. Manual valves control tilting and trim positioning of the unit, and steering, while pressure relief valves are arranged to prevent damage to the unit and system upon excess steering control, striking of external objects, and the like.

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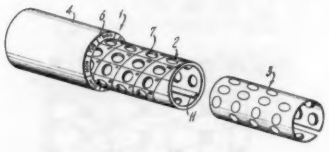
**3,654,890**
**TABLET DISPENSER**
**William R. Rigney, Watchung; Robert A. Luciano, Warren, and Dirk Tump, Lebanon, all of N.J., assignors to Ortho Pharmaceutical Corporation**
**Filed Sept. 22, 1970, Ser. No. 74,438**
**Int. Cl. G09f** *9/00*
**U.S. Cl. 116—121** **3 Claims**



A tablet dispenser is provided in which both the calendar element and tablet element are hollow cylinders. The tablet element is both slidably and rotatably mounted within the calendar element. Indicia identifying days of the week are disposed on the surface of the calendar element adjacent its interface with the tablet element. The tablets are aligned in a series of axially oriented columns disposed circumferentially around the tablet element. In use, the tablet element is rotated with respect to the calendar element to align the first tablet to be taken with the indicia representing the day on

which it is to be taken, thus automatically aligning each column of tablets with the indicia representing the day of the week on which they are to be taken. The tablet element is moved in and out of the calendar element to expose the next tablet to be taken on the day in question. The tablet is pushed inward through the tablet element into the hollow center of the same and into the patient's hand.

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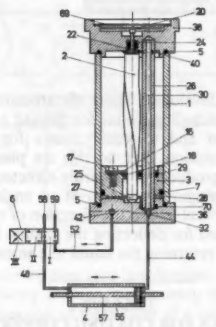
**3,654,891**

## GAUGE CYLINDER ASSEMBLY FOR POSITION INDICATOR AND INDICATOR SYSTEM INCLUDING SUCH CYLINDER

**Saebjorn Aas, Tynemouth, England, and Kare Brathen, Rjukan, Norway, assignors to Norsk Hydro Verksteder A/S, Rjukan, Norway**

**Filed Dec. 29, 1969, Ser. No. 888,494**
**Claims priority, application Norway, Dec. 30, 1968, 5235/68**
**Int. Cl. G09f** *9/00*
**U.S. Cl. 116—124** **1 Claim**



A volumetric gauge cylinder for a position indicator comprising a closed cylinder having connections for pressure fluid at its ends. A non-rotatable axially movable piston is capable of movement within the cylinder under the fluid pressure, and a rotatable spindle extends along the length of the cylinder and has a helical external configuration cooperating with, and forming a sealed fit with a correspondingly shaped opening in the piston so that linear movement of the piston is translated into rotary movement of the spindle. The spindle is operationally connected to an external indicator which is caused to rotate in accordance with movement of the spindle.

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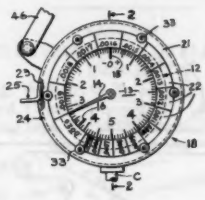
**3,654,892**

## ZONAL DEVICE AND COMBINATION THEREOF WITH A DIMENSIONAL DIAL INDICATOR

**Stanley G. Johnson, W. Hartford, Conn., assignor to The Johnson Gage Company, Bloomfield, Conn.**

**Filed July 17, 1970, Ser. No. 55,896**
**Int. Cl. G09f** *9/00*
**U.S. Cl. 116—129** **13 Claims**

A zonal device and a combination of a dial indicator and the zonal device is disclosed for cooperative use on a gage or gages in differentially gaging a screw thread. The indicator has a casing with an outer cylindrical surface, a dial having dimensional graduations in thousandths or preferably in ten-thousandths of an inch, and a pointer movable over the dial in response to a contactor. The zonal device is a ring means mounted on the cylindrical surface of the casing and includes or is a turnable ring with a flange extending radially inwardly adjacent to the dial graduations. This flange which is the end face of the ring carries at least one of a plurality of zones of fixed circumferential dimension and radially corresponding



with a desired dimension of the dial graduations. The fixed zones on the ring may be provided in any one of three ways.

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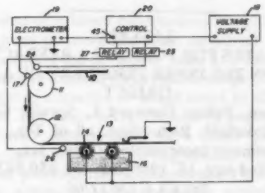
**3,654,893**

## AUTOMATIC BIAS CONTROL FOR ELECTROSTATIC DEVELOPMENT

**Douglas E. Piper; James G. Jarvis, and Dale L. Smith, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed May 1, 1970, Ser. No. 33,571**
**Int. Cl. G03g** *13/08, 15/08*
**U.S. Cl. 118—2** **8 Claims**




An automatic bias control for development of a latent electrostatic image comprises an electrometer for continuously measuring the level or amplitude of the electrostatic charge in the areas comprising said image and for providing a proportional signal that is used to control the electrical bias applied to development means. The proportional signal is used to drive a circuit containing three serially connected operational amplifiers which are interconnected in accordance with and in timed relation to the location of the image relative to a probe head connected to the electrometer and to a development station. The control signal generated by the circuit is used to drive a voltage supply means whereby a bias field corresponding generally to the amplitude of the charge level of the image background areas is provided so that a minimum of toner particles will be applied to these areas.

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**3,654,894**

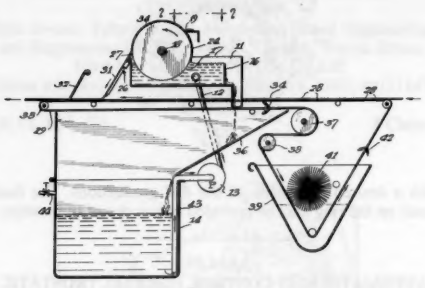
## PASTRY COATING APPARATUS

**James T. Rohrbacher, Chicago, and Richard C. Wagner, Clarendon Hills, both of Ill., assignors to Integral Process Systems, Inc.**

**Continuation-in-part of application Ser. No. 755,592, Aug. 27, 1968, now Patent No. 3,537,404. This application May 11, 1970, Ser. No. 36,206**
**Int. Cl. A23g** *3/20;* **B05c** *5/02*
**U.S. Cl. 118—17** **9 Claims**

An apparatus and method for automatically and continuously providing a coating on an upper surface of individual pastries including a liquid reservoir at a dispensing station, means for maintaining a preselected level of liquid within said reservoir, a rotary drum having a portion disposed below

the liquid level in said reservoir for picking up liquid by surface adhesion, said drum having a portion disposed above the level of liquid in said reservoir, stripping means for removing



liquid from the exposed portion of said drum and for depositing the liquid on said pastries on a continuously movable foraminous conveyor with excess liquid passing through said conveyor for recycle to said reservoir.

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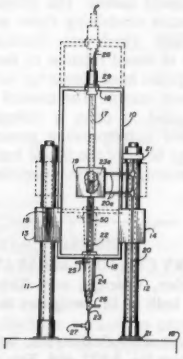
**3,654,895**

**APPARATUS FOR FORMING A REFRACTORY COATING ON THE INNER PERIPHERY OF A TUBULAR OBJECT**

**John A. Bloom, Dallas; Durward L. Spruill, Garland, and Gene F. Wakefield, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Aug. 15, 1969, Ser. No. 850,543**
**Int. Cl. C23c *11/00***
**U.S. Cl. 118—48** **12 Claims**



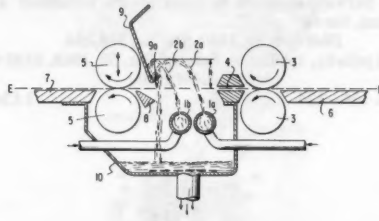
Means to vapor-coat the inside of a tubular object includes an annular heater surrounding a portion of the object, a lance-nozzle extending within the object. The nozzle is transversely aligned with and fixed with respect to the heater. Means effect relative longitudinal motion between the tubular object and the aligned heater and nozzle.

**3,654,896**

**APPARATUS FOR DEVELOPING ELECTROSTATIC IMAGES**

**Gerhard Marx, Wiesbaden-Kastel, and Hans Heist, Wiesbaden-Schierstein, both of Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany**

**Filed Aug. 18, 1966, Ser. No. 573,294**
**Claims priority, application Germany, Aug. 21, 1965, K 56946**
**Int. Cl. B05c *5/00*, *11/02***
**U.S. Cl. 118—50** **8 Claims**



Apparatus for developing latent electrostatic images with liquid developer including means for passing a carrier past a developing station and a nozzle means for applying the developer at the station. The nozzles are placed below the carrier path and produce an upwardly directed laminar flow curtain which impinges the carrier at an angle between 10° and 45° to the vertical and in the direction of carrier motion. Means are provided for deflecting the curtain in the absence of the carrier and returning the liquid to a storage container.

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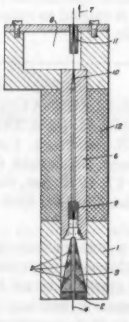
**3,654,897**

**APPARATUS FOR COATING COPPER WIRES**

**Herman Trattner, and Erich Liebhard, both of Muenchen, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany**

**Original application Mar. 15, 1968, Ser. No. 713,491, now Patent No. 3,540,918. Divided and this application Jan. 12, 1970, Ser. No. 7,441**
**Int. Cl. B05c *11/00***
**U.S. Cl. 118—69** **7 Claims**



An apparatus for continuously coating a copper wire with a solder layer comprising a chamber in which molten solder is disposed, a nozzle disposed at the bottom of said chamber, having a vertically extending passageway therein, for the en-

trance of the wire to be coated, which communicates with the solder bath through laterally extending passages communicating with the chamber, means disposed above the nozzle forming a counter current section having a counter flow passageway through which the upwardly moving wire passes and in which solder may flow in downward counter direction, said counter flow passageway tapering in cross-section at the beginning and end of the passageway whereby the clearance with respect to the wire is less at such ends than at an intermediate portion thereof and a stripping nozzle disposed above the outlet of said counter flow passageway, the nozzles and the inlet portion of said counter current section preferably being formed from a material not wettable by the solder.

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**3,654,898**

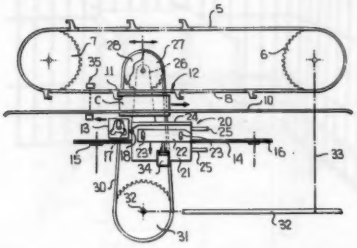
**OUTSIDE SIDE-STRIPPING DEVICE**

**Raymond F. Galitz, La Grange Park, Ill., assignor to Continental Can Company, Inc., New York, N.Y.**

**Filed July 17, 1970, Ser. No. 55,655**

**Int. Cl. B05b** *9/06*

**U.S. Cl. 118—323** **11 Claims**



This disclosure relates to a mechanism for side-stripping can bodies utilizing a spray gun moving in a direction opposite to the direction of movement of a can body to provide a thin striping or coating on the side seam thereof. The striping apparatus includes a synchronizing mechanism which is in engagement with a conveyor chain moving the can bodies to be side striping and which varies the position of the control mechanism of the side striping apparatus in accordance with the variations in the links or other constructional elements of the conveyor chain.

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**3,654,899**

**APPARATUS FOR COATING FOILS OR BANDS ON ONE SIDE WITH SOLUTIONS OF HIGH VISCOSITY**

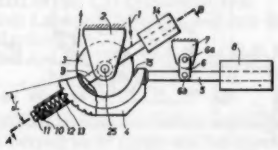
**Peter Herzhoff, Leverkusen; Hans Gref, Cologne, and Stephan Platz, Leverkusen, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany**

**Filed June 22, 1970, Ser. No. 48,037**

**Claims priority, application Germany, July 12, 1969, P 19 35 554.5**

**Int. Cl. B05c** *3/152, 3/12*

**U.S. Cl. 118—419** **9 Claims**



In an apparatus for coating foils or bands on one side with solutions of high viscosity as the foils or bands are passed through a gap, the surface of one wall of which is wetted with the solution of the gap is formed by a rotatably mounted support roller for the band which is to be coated and the other wall surface is formed by a cup which is adapted to the circumference of the roller and which is suspended via a weight loaded lever system in such a manner that it is three-dimensionally displaceable on it.

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**3,654,900**

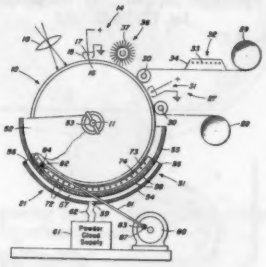
**FLUIDIZED DEVELOPMENT OF ELECTROSTATIC IMAGES**

**Frank Y. Yang, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Sept. 17, 1970, Ser. No. 72,997**

**Int. Cl. G03g** *13/00*

**U.S. Cl. 118—637** **14 Claims**



Development of a latent electrostatic image is effected by vibrating a mass of two-component developer on a support surface to maintain the developer mass in a fluidized state in close proximity to a latent electrostatic image bearing surface whereby toner is attracted to image areas to effect development thereof. The toner is replenished by passing toner from a suitable toner supply, such as a toner powder cloud, through apertures in the supporting surface which are larger than the toner particles and smaller than the carrier particles, whereby an adequate toner supply is maintained in the development zone without recirculating the carrier.

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**3,654,901**

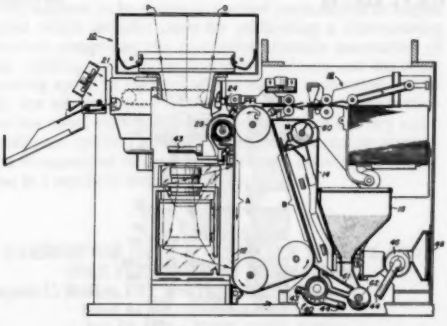
**TONER RECLAIMING SYSTEM**

**James M. Donohue, Rochester, and Dennis P. Gerbasi, West Webster, both of N.Y., assignors to Xerox Corporation, Rochester, N.Y.**

**Filed Aug. 6, 1969, Ser. No. 847,866**

**Int. Cl. G03g** *13/00*

**U.S. Cl. 118—637** **5 Claims**



A toner powder reclaiming apparatus for use with the developing system of an electrostatic reproduction machine

including a rotating drum in the path of movement of an air flow containing electrically charged toner particles which become attracted to the drum. Means such as carrier beads are brought into contact with the drum for cleaning the toner off the collecting surface thereon. After the toner particles become triboelectrically attracted to the carrier beads, they are directed automatically into the developing system for the machine.

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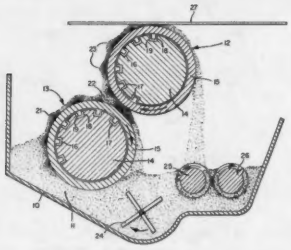
**3,654,902**

**TONER UNIT FOR PHOTOELECTROSTATIC REPRODUCTION**

Nils L. Hakanson, West Springfield, Mass., assignor to The Plastic Coating Corporation, South Hadley, Mass.

Filed Nov. 28, 1969, Ser. No. 880,600
Int. Cl. B05b *5/02*
U.S. Cl. 118—637 4 Claims



Apparatus for applying toner to an electrostatic image carried by an insulating surface by contacting the surface with a toner mix comprising toner particles and magnetic carrying particles, which apparatus utilizes tandem magnetic brush units cooperatively arranged so that their adjacent surfaces move counter to one another, one of the magnetic brush units being arranged to form a magnetic brush from toner mix supplied thereto and to transfer toner mix in the magnetic brush to the other magnetic brush unit for formation of a second magnetic brush which may be brought into contact with the electrostatic image on the insulating surface.

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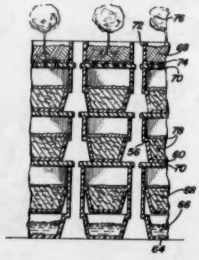
**3,654,903**

**METHOD OF GROWING EARTHWORMS AND PLANTS AND PRODUCING COMPOST**

Morris M. Montgomery, P. O. Box 536, Cottonwood, Ariz.

Filed Oct. 30, 1970, Ser. No. 86,154
Int. Cl. A01k *67/00*
U.S. Cl. 119—15 10 Claims



A building structure providing a controlled environment for growing earthworms and plants and producing compost by the use of a plurality of leaching and growing columns each having a plurality of stacked containers having a quantity of bedding therein except for the bottom container which receives compost from the stack. All of the containers above the bottom container have drain holes therein whereby leaching liquid may be poured into the uppermost container for leaching compost from the containers for collection in the bottom container. Plants may be grown in the upper container.

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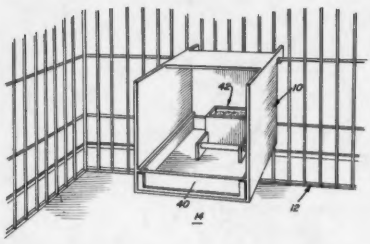
**3,654,904**

**BIRD FEEDER**

Clement E. Krueger, P.O. Box 4144 Walnut Creek, Calif.

Filed Apr. 3, 1970, Ser. No. 25,510
Int. Cl. A01k *31/00*
U.S. Cl. 119—18 3 Claims



A housing has an opening formed in the forward portion thereof to allow insertion and removal of a tray. A feeding cup is attached to the tray and serves as a receptacle for bird feed. The housing serves as a shield against outward scattering of feed and the tray prevents feed from being dropped downwardly into a surrounding cage. Feed is easily replenished and the tray is conveniently cleaned by removing the tray from the housing.

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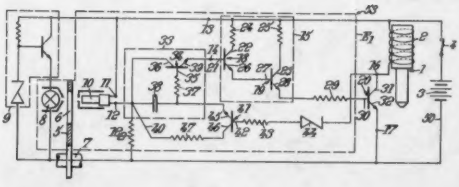
**3,654,905**

**IMPROVEMENTS IN OR RELATING TO FEED DEVICES FOR INTERNAL COMBUSTION ENGINES**

Andre Louis Mennesson, Neuilly-sur-Seine, France, assignor to Societe Industrielle De Brevets Et D'Etudes S.I.B.E., Neuilly-sur-Seine, France

Filed Oct. 14, 1969, Ser. No. 866,219
Claims Priority, application France, Oct. 23, 1968, 171095; Mar. 12, 1969, 6907041
Int. Cl. F02d *5/00*
U.S. Cl. 123—32 EA 6 Claims



The invention relates to fuel feed devices for internal combustion engines, of the kind comprising at least one fuel valve

openable by an electromagnet for as long as the same is energized under the control of a signal delivered by an energizing system brought into operation simultaneously with the engine ignition system and adapted to transmit, in synchronism with the rotation of a rotating member drivable after the bringing into action of the engine ignition system, signals whose duration depends upon engine operating conditions. The energizing system comprises means which interrupt transmission of the signal and close the valve when the duration of the signal reaches a predetermined maximum value.

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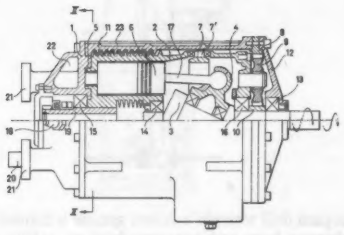
**3,654,906**
**AXIAL CYLINDER ROTARY ENGINE**
**Timo Airas, Puistokatu 3 A, Helsinki 14, Finland**
**Filed May 7, 1970, Ser. No. 35,542**
**Claims priority, application Finland, May 9, 1969, 1376/69**
**Int. Cl. F02b** *57/04*
**U.S. Cl. 123—43 A** **3 Claims**



An internal combustion engine has a rotating group of axial cylinders around a swash plate driven crankshaft. Each cylinder has only one port for intake and exhaust this port ending directly at a sliding seal against a plain or substantially plane distributor surface on the gable of the stationary engine frame. This stationary distributor surface is provided with a least two sets of intake and exhaust ports as well as ignition devices so arranged that during a full revolution of the cylinder group two full series of four-cycle sequences occur in each cylinder. The cylinder group and crankshaft rotate at different speeds and the relation between these speeds to each other and to the stationary frame, are determined by a gear. The gear arrangement and ratio is depending of the number of cylinders and the number of four cycle sequences per cylinder group revolution.

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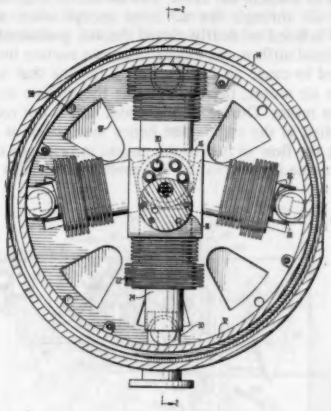
**3,654,907**
**ROTATING CYLINDER ENGINE**
**Clarence Bartlett; Laurence D. Bartlett, and Dale Bartlett, all of Route 2, Hartford, Ky.**
**Filed Apr. 20, 1970, Ser. No. 29,995**
**Int. Cl. F02b** *57/00*
**U.S. Cl. 123—44** **11 Claims**

A rotating cylinder internal combustion engine includes an eccentric shaft carrying an air supply and fuel injection outlet for each engine cylinder, a plurality of engine cylinders mounted to rotate about the shaft so as to receive air from the associated air supply outlet on the shaft at the bottom of a piston stroke when the internal cylinder volume is at a maximum and fuel near the top of the stroke when the air is compressed, and a rotor structure surrounding the eccentric shaft and the engine cylinders and connected to the pistons, and



exhaust ducts passing through the engine cylinder side wall and the piston for exhausting air.

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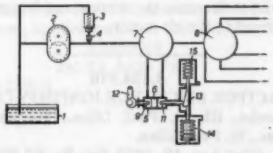
**3,654,908**
**FUEL INJECTION SYSTEMS**
**John Kammerer Harding, Cheltenham, England, assignor to Dewty Technical Developments Limited, Brockhampton, Cheltenham, England**
**Filed July 25, 1969, Ser. No. 844,790**
**Claims priority, application Great Britain, July 30, 1968, 36,218/68**
**Int. Cl. F02d** *1/06*
**U.S. Cl. 123—140 MC** **2 Claims**



A fuel-injection apparatus for a multi-cylinder internal combustion engine comprising a fuel pump, a free piston mounted for reciprocation in a cylinder between stops and defining two variable-volume working spaces and a face valve adapted to be driven at a speed proportional to engine speed which includes ports for performing a commutating function comprising the successive alternate connection of one working space to the fuel pump delivery and the other working space to the engine fuel supply connection and of the one working space to the engine fuel supply connection and the other working space to the fuel pump delivery and a distributor function in which the engine fuel supply connection is connected to the injectors for the cylinders of the engine in a regularly recurring sequence.

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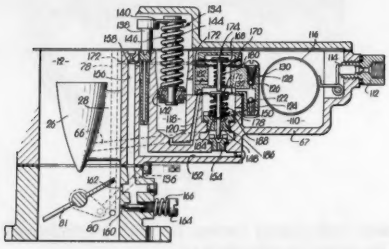
**3,654,909**
**CARBURETOR HAVING AUXILIARY TURBINE AND IDLE FUEL SHUTOFF MECHANISM**
**Eugene C. Rollins, P.O. Box 1484, Ogden, Utah**
**Filed Aug. 6, 1970, Ser. No. 61,624**
**Int. Cl. F02m** *29/00, 23/00, 13/04*
**U.S. Cl. 123—141 R** **32 Claims**

A carburetor for an internal combustion engine utilizes a rotatable air motor to achieve intimate mixing of fuel and air

and hence provide a combustible mixture of enhanced burning qualities to the engine. The air motor utilizes a hollow, rotatable hub with fuel jets to deliver the fuel and a plurality of vanes to atomize the same. The air motor is driven by the flow of air through the air horn except when airflow is minimal (closed or nearly closed throttle positions). During this minimal airflow, the engine creates a suction head which is utilized to cause air to flow over a turbine that is coupled with the air motor, thereby rotating the turbine to, in turn, drive the motor. During deceleration, fuel is not required to be supplied to the engine and hence mechanism is provided to block the flow of fuel to the engine in response to closing of the engine throttle valve. The mechanism is also operable



by the decrease in pressure caused by the suction head created when the engine descends a long steep grade and hence will continue to block the flow of fuel during such a descent as long as the throttle valve remains closed.

Fuel is delivered to the air motor as a result of a suction conduit which has an outlet into the interior of the air horn. Thus, during the minimal airflow this fuel is atomized effectively by the rotation of the air motor and when fuel is not needed, the flow is completely shut off. When it is desirable to increase the quantity of fuel delivered to the air motor to meet the power requirements of the engine, one or more venturi boost rings are employed in the vicinity of the suction conduit outlet to increase the suction and hence the quantity of fuel delivered to the air motor.

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**3,654,910**

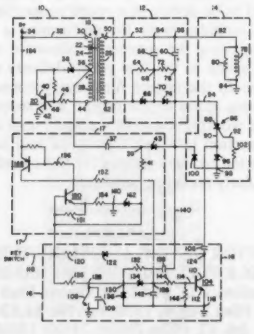
**CAPACITOR DISCHARGE IGNITION CIRCUIT**

**Andrew Kuehn, III, St. Paul, Minn., assignor to Systematics, Inc., St. Paul, Minn.**

**Filed Aug. 10, 1970, Ser. No. 62,398**

**Int. Cl. F02p** *3/06*

**U.S. Cl. 123—148 E** **9 Claims**



A capacitor discharge ignition circuit for an internal combustion engine, the active components of which are substantially entirely solid state devices. An energy generation circuit is provided which includes a re-generative pulse amplifier and saturable transformer to convert the normal battery potential to a higher voltage. A capacitive energy storage circuit is coupled to the energy generation circuit and a triggerable switching device permits the stored energy to be discharged through the primary winding of the ignition coil. A triggering circuit which preferably has variable timing properties is coupled to the ignition breaker points and is used to time the triggering of the switching device.

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**3,654,911**

**SURGICAL DRILL**

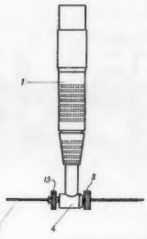
**Hans Loge, Biberach (Riss), Germany, assignor to Kaltenbach & Voigt, Biberach (Riss), Germany**

**Filed Mar. 23, 1970, Ser. No. 21,680**

**Claims priority, application Germany, Mar. 27, 1969, P 19 15 667.3**

**Int. Cl. A61b** *17/32;* **B25g** *3/22;* **B23b** *5/34*

**U.S. Cl. 128—305** **8 Claims**



A surgical drill wherein a driven spindle is formed with an axial through bore and accommodates an axially movable clamping member which can either engage or release an elongated drilling tool. A nut is employed to move the clamping member between a first axial position in which the clamping member receives torque from the spindle and rotates the tool, and a second axial position in which the tool can be shifted axially of the clamping member and spindle so as to move a desired length of the tool beyond the spindle, to wit: a length which is sufficient to permit deeper penetration into a bone or the like but not enough to permit uncontrolled flexing of the tool. The axial length of the toll may exceed several times the axial length of the spindle.

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**3,654,912**

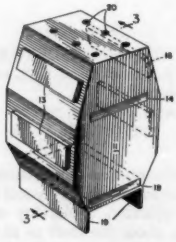
**FOOD-BROILING APPARATUS**

**Charles Jere Albright, 313 West North Avenue, Chicago, Ill.**

**Continuation-in-part of application Ser. No. 682,033, Nov. 13, 1967, now abandoned. This application May 21, 1969, Ser. No. 826,503**

**Int. Cl. A47j** *37/06;* **F24c** *3/04*

**U.S. Cl. 126—41 R** **9 Claims**



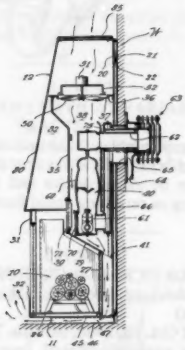
The essential concept of this invention involves a cabinet defining a cooking chamber and wherein are mounted a plu-

rality of incandescent-type heating elements vertically and horizontally disposed with respect to the central area of the cooking chamber, the cabinet having horizontally-disposed therein at least one elongated opening medially of the heating elements for the insertion and positioning of food-supporting facility, to expose the food to cooking on all areas by the simultaneous action of the heating elements, subject to a withdrawal of the facility with cooked food thereon.

### 3,654,913
### GAS-BURNING WALL FIREPLACE

**Ray Derringer, Port Edwards, and Francis L. Faehling, Wisconsin Rapids, both of Wis., assignors to Preway Inc.**

**Filed Jan. 30, 1970, Ser. No. 7,196**
**Int. Cl. F24b** *1/18; F24h 3/02*
**U.S. Cl. 126—121** **1 Claim**



A gas-burning wall fireplace, mountable on a wall and having a frame with a log display area and a heat exchange chamber located above said log display area with a sealed combustion unit therein, an air flow passage through said chamber including an outlet extending across and beneath the log display area, blower means for inducing air flow through the air passage with cool air entering near the top of the fireplace, and a decorative hood which can be removed for access to the blower means and the combustion unit.

### 3,654,914
### COSMETIC SURGICAL PROCESS

**Robert Alan Franklyn, 8706 Sunset Boulevard, Los Angeles, Calif.**

**Filed Aug. 21, 1970, Ser. No. 66,108**
**Int. Cl. A61b** *19/00*
**U.S. Cl. 128—1 R** **3 Claims**

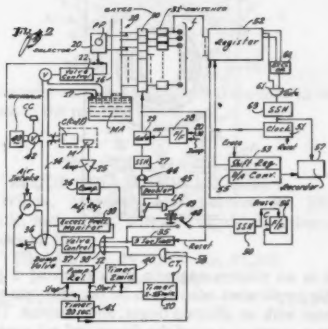
There is disclosed a process for achieving a subcutaneous padding during cosmetic surgery. Subcutaneous tissue and fat is recovered from redundant skin which is surgically removed during plastic surgery. The tissue and fat are formed into a homogeneous mixture as by mixing it with a saline solution or Ringers solution in a high speed blender. The homogenized mixture is then spray injected through the incision underneath the tightened skin of the patient's face. This results in a well contoured appearance of the skin due to restoration of subcutaneous padding.

### 3,654,915
### APPARATUS FOR AUTOMATICALLY MEASURING AND INDICATING BLOOD PRESSURE

**Clifford Sanctuary, Palos Verdes, Calif., assignor to Del Mar Engineering Laboratories, Los Angeles, Calif.**

**Filed Dec. 19, 1969, Ser. No. 886,654**
**Int. Cl. A61b** *5/02*
**U.S. Cl. 128—2.05 M** **18 Claims**

An automatic blood pressure measuring and indicating instrument is controlled with fail-safe features such as fast dumping pressure from an inflated cuff upon actual detection of diastolic pressure, a predetermined period after pump starting. The pump is turned off either when a selected pressure has been reached, or a predetermined period after starting. If measurement has not begun at that time, fast dumping

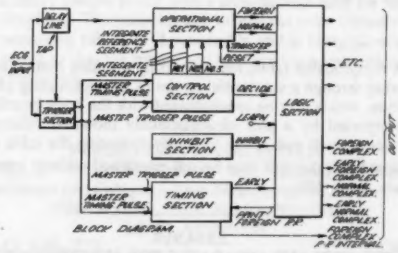


is initiated. Signal processing to eliminate artifacts includes the elimination of Korotkoff sound detect signals neither preceded nor succeeded by another. Synthetized Korotkoff sounds are used to accommodate very low heat beat conditions. Different size cuff adaption is provided for.

### 3,654,916
### APPARATUS FOR MONITORING RECURRENT WAVEFORMS

**James McEwan McIntyre Neilson, Edinburgh, Scotland, assignor to The University of Edinburgh, Edinburgh, S.C.**

**Filed Mar. 16, 1970, Ser. No. 19,715**
**Claims priority, application Great Britain, Mar. 14, 1969, 13,659/69**
**Int. Cl. A61b** *5/04*
**U.S. Cl. 128—2.06 A** **14 Claims**

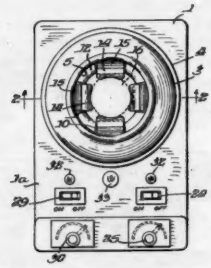


An electrocardiogram waveform is monitored by superimposing the waveform complexes upon a stored waveform complex representative of a 'normal' complex, using derived reference levels and timing data and then integrating successive segments of a waveform complex, measuring the difference between the integrated value of each segment in the complex and the integrated value of a corresponding segment of a normal waveform complex, quantitatively summing the differences and producing a signal and/or record if the total difference exceeds a predetermined value.

### 3,654,917
### THERAPEUTIC DEVICE FOR ARTHRITIS

John A. Dienner, 53 West Jackson Boulevard, Evanston, Ill.

Filed Nov. 23, 1970, Ser. No. 91,886
Int. Cl. A61h 1/02
U.S. Cl. 128—26 5 Claims

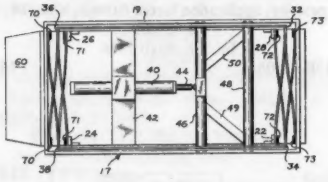


This is an electro-magnetic device having a plurality of movable applicators adapted to be brought into yielding engagement with an affected finger, and vibrated. The applicators, as a group, surround the finger and are pressed against the sides of the finger and are moved lengthwise of the finger back and forth over one or the other of the two free finger joints with a stroking motion.

### 3,654,918
### EQUIPMENT FOR AIDING CARDIOVASCULAR CIRCULATION

Petrus Blok, Coymanstraat 7, Moerkapelle, and Taco Jan Viersma, Julianalaan 26, Pijnacker, both of Netherlands

Filed May 15, 1970, Ser. No. 37,744
Int. Cl. A61h 1/00
U.S. Cl. 128—33 9 Claims



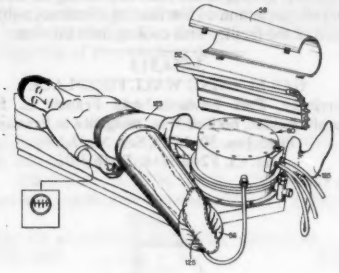
A reciprocable table, for supporting a supine human body, moving through a substantial stroke in a reciprocating planar motion, which may be synchronized with the body heartbeat, is supported by a pair of horizontally mounted bifurcated springs at each end of the table. By mounting the table on a hollow base, the unit may be self-contained without external hoses, or the like.

### 3,654,919
### PROCESS AND APPARATUS FOR SYNCHRONOUS ASSISTING OF BLOOD CIRCULATION

William Clifford Birtwell, North Scituate, R.I., assignor to Medical Innovations, Inc., Newton, Mass.

Filed Nov. 25, 1970, Ser. No. 92,606
Int. Cl. A61h 7/00
U.S. Cl. 128—64 13 Claims

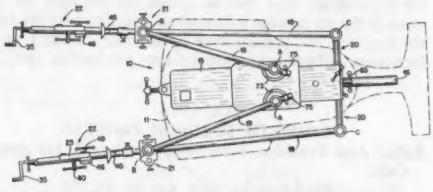
Apparatus useful in enhancing or assisting the circulation of blood, reducing the work of the heart and increasing the coronary blood flow, said apparatus comprising a rigid, incompressible system which provides an external pulsatile pressure environment on a portion of the body which is synchronous and phased with cardiac action. A rigid chamber or chambers with a liquid filled system of non-distensible, yet expandable, seals houses a portion of the body (e.g., the limbs) in such a way that the pressure exerted on the body can be varied above and below atmospheric pressure by adding or removing liquid from the system.



### 3,654,920
### TRACTION DEVICES FOR ORTHOPEDIC TABLES

Armando Staib, deceased, late of Guanabara, Brazil (by Erika Esch, executrix)

Filed Oct. 16, 1968, Ser. No. 768,041
Claims priority, application Brazil, June 6, 1968, 199,660
Int. Cl. A61f 5/00
U.S. Cl. 128—71 4 Claims



An orthopedic table including traction arms for performing orthopedic traction in the upper and lower limbs of the patient includes a traction device mounted at the free end of each traction arm, said traction device includes a worm and worm gear arrangement, first manual means for operating the worm so as to produce traction displacements in a range of millimeters and a second manually operable means producing traction displacements of a greater magnitude.

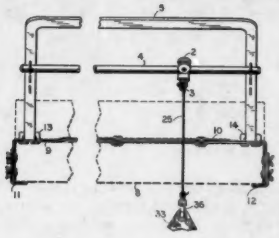
### 3,654,921
### MECHANICAL TRACTION

Benjamin John Neuhardt, Jr., 5501 Riggs Road, Gaithersburg, Md.

Filed July 1, 1970, Ser. No. 28,349
Int. Cl. A61h 1/02
U.S. Cl. 128—75 1 Claim

A mechanical traction device, mountable on the foot portion of a bed, for allowing one in traction a freedom in motion with minimal effort while maintaining a constant traction

pressure. Lateral movement is effected by the use of a traveling wheel assembly mounted on a horizontally supported



member with vertical movement rendered possible by the use of a pulley connected to the wheel assembly.

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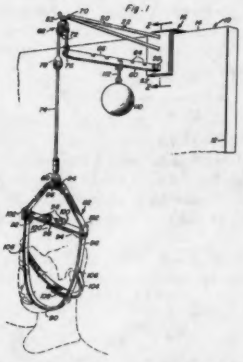
3,654,922
**DOOR MOUNTED CERVICAL VARIABLE WEIGHT TRACTION UNIT**

**Dale E. Outcalt, P.O. Box 84, Flat Rock, Ill.**

**Filed July 10, 1970, Ser. No. 53,911**
**Int. Cl. A61h** *1/02*
**U.S. Cl. 128—75** **6 Claims**



A support assembly for stationary support from a suitable structure and including a support arm pivotally supported therefrom for swinging in a vertical plane about a horizontal transverse axis. An elongated upright tension member is provided and one end portion of the arm defines an anchor point to which the upper end of the upright tension member is attached. The lower end portion of the tension member has a head sling supported therefrom and a weight is carried by the arm and adjustable therealong relative to the axis of oscillation of the arm for swinging the arm, by gravity weighting, in a direction causing the lower end portion of the tension member and the head sling supported therefrom to be urged upwardly, whereby an upward force may be exerted upon a person's head engaged by the sling.

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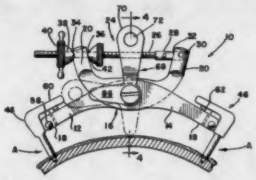
3,654,923
**SKULL TONGS**

**William Gayle Crutchfield, School of Medicine, University of Va., Charlottesville, Va.**

**Filed Apr. 8, 1970, Ser. No. 26,535**
**Int. Cl. A61f** *5/04*
**U.S. Cl. 128—84 R** **1 Claim**

A skull tong is provided for use in applying skeletal traction in treatment of injuries to the cervical spine wherein each of the skull pins is mounted for limited or restricted



pivotal movement on an axis generally transverse to the longitudinal axis of the respective skull pins.

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3,654,924
**BLOOD COLLECTION ASSEMBLY**

**Earl D. Wilson, Ingleside, and Norbert W. Ellmann, Libertyville, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.**

**Filed May 14, 1970, Ser. No. 37,205**
**Int. Cl. A61m** *05/14*
**U.S. Cl. 128—214 D** **12 Claims**

Disclosed herein is a blood collection assembly including an auxiliary sample pouch with a pass-through tube for filling the blood bag. The pass-through tube is the same diameter as the remaining tubing of the assembly and is frangible within the pouch so that the tubing can be placed in communication with the pouch.

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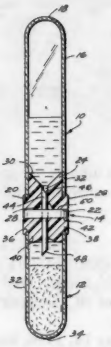
3,654,925
**PLASMA SEPARATOR SYSTEM**

**William J. Holderith, Wyckoff, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.**

**Filed Sept. 23, 1969, Ser. No. 860,191**
**Int. Cl. A61j** *01/00*
**U.S. Cl. 128—272** **1 Claim**

A blood-collecting tube of the evacuated type containing an anticoagulant receives through normal techniques whole blood to be tested. Thereafter, a cell-collecting tube is interconnected with the blood-collecting tube through the intermediary of a double-ended needle assembly including an external discoidal hub intermediate the ends thereof, such that the interior of both tubes communicate with one another. The tubes with the interconnecting needle assembly are then subjected to centrifugation with the cell-collecting tube being spaced radially outwardly relative to the blood-collecting tube and the axis of rotation. Upon generation of sufficient

centrifugal forces, the plasma separates from the heavier constituents with the latter and particularly the blood cells being forced out into the cell-collecting tube and packed therein. The relative capacities of the tubes are such that in



the blood-collecting tube only plasma will remain following completion of centrifugation. The needle assembly is then removed from the blood-collecting tube to effectively separate and remove plasma from the remaining constituents of the blood.

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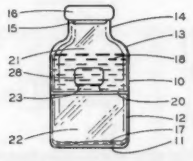
**3,654,926**

**MIXING VIAL**

**Harry J. Rietman, Washtenaw, Mich., assignor to Parke, Davis & Company, Detroit, Mich.**

**Filed Nov. 17, 1969, Ser. No. 877,108**
**Int. Cl. A61j *1/06***
**U.S. Cl. 128—272** **6 Claims**



A pharmaceutical mixing vial having a separate axial compartments for storing dissimilar component medicaments, at least one of which comprises water suitable as a vehicle for injection. A wall between the compartments includes a needle-pierceable static seal or plug. In use, the operator having a hypodermic syringe invades the vial and takes up liquid in one compartment, transfers it to a different compartment for mixing there with the separate component, and in turn aspirates the dispenses the resulting mixture.

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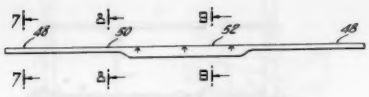
**3,654,927**

**PROTECTIVE SHIELD FOR HOLDING SANITARY NAPKINS AND METHOD OF MAKING**

**Susan R. Surpless, Metuchen, N.J., assignor to Johnson & Johnson**

**Filed Mar. 5, 1970, Ser. No. 16,801**
**Int. Cl. A61f *13/16***
**U.S. Cl. 128—290 H** **1 Claim**

A protective shield for holding sanitary napkins in place during use comprising an elongated nonwoven fabric of overlapping, intersecting fibers having a primary or predominant direction of fiber orientation substantially in the long direction of the elongated nonwoven fabric whereby the elongated nonwoven fabric possesses excellent strength in its long direction and considerable extensibility in its cross



direction, the side edges of the central portion of the protective shield being gathered together to form a boatlike configuration capable of securely holding a sanitary napkin in place therein during use.

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**3,654,928**

**FLUSHABLE WRAPPER FOR ABSORBENT PADS**

**David V. Duchane, Menasha, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.**

**Filed Feb. 24, 1970, Ser. No. 13,588**
**Int. Cl. A61f *13/16***
**U.S. Cl. 128—290** **10 Claims**

A flushable wrapper for sanitary napkins and other absorbent pads. The wrapper comprises a non-woven fiber web bonded by cold-water soluble polyvinyl alcohol and subsequently treated with an insolubilizing agent which renders the polyvinyl alcohol resistant to solubilization in a moisture laden environment. A web thus bonded has enough wet strength and abrasion resistance to perform satisfactorily at moisture levels encountered during normal use, yet disintegrates sufficiently fast after soaking in excess water to permit disposal by flushing.

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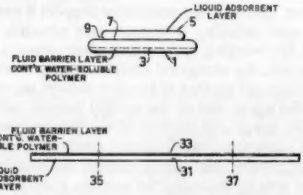
**3,654,929**

**BODY-FLUID ABSORPTION ARTICLE**

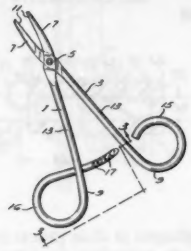
**Marit Gunnel Matilda Nilsson, Kalarne; Ruth Gunvor Anna Britt Udden; Per Edward Carl Udden, both of Timra, and Bengt Axel Wennerblom, Sundsvall, all of Sweden, assignors to Svenska Cellulosa Aktiebolaget, Sundsvall, Sweden**

**Filed Nov. 9, 1967, Ser. No. 681,706**
**Claims priority, application Sweden, Nov. 15, 1966, 15634/66**
**Int. Cl. A61f *13/16***
**U.S. Cl. 128—287** **8 Claims**


LIQUID ABSORBENT LAYER
FLUID BARRIER LAYER-CONT'S. WATER-SOLUBLE POLYMER
FLUID BARRIER LAYER CONT'S. WATER-SOLUBLE POLYMER
LIQUID ABSORBENT LAYER

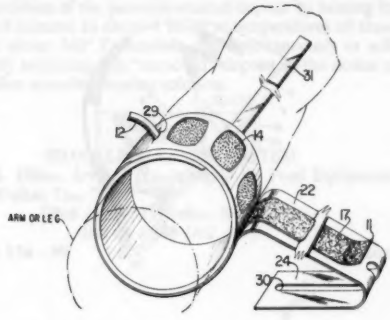
The invention resides in a body-fluid absorption article which comprises at least two elongated and substantially flat members which, in use of the article, are relatively superimposed with opposed flat surfaces, said members being physically separated throughout, or over a substantial portion of, their interface. The article is further characterized in that its inner member, i.e., the member adapted to be worn next to the skin, mainly consists of a liquid-absorbent material, whereas its outer member comprises one or a plurality of fluid-barrier layers of a water-soluble polymer, such as carboxy-methyl cellulose, capable of preventing any passage of body fluids, at least for the time of use of the article.

3,654,930
EXPENDABLE HEMOSTAT
James C. Hobbs, II, 4383 Ingraham Highway, Miami, Fla.
Filed June 18, 1970, Ser. No. 47,436
Int. Cl. A61b *17/12, 17/28*
U.S. Cl. 128—325 2 Claims



An expendable, strong, resilient, springy hemostat composed of two soft wire parts pivotally connected together between their jaw and handle ends and having loops at their finger ends and notches on one loop engageable with a latch on the other handle for maintaining the jaw ends in gripping relation.

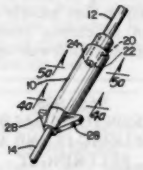
3,654,931
DISPOSABLE TOURNIQUET COVER
Lewis F. Hazlewood, Marlton, N.J., assignor to Walter Kidde & Company, Inc., Belleville, N.J.
Filed Feb. 11, 1970, Ser. No. 10,511
Int. Cl. A61b *17/12*
U.S. Cl. 128—327 8 Claims




A disposable cover for an inflated tourniquet which has an elongated inflatable member and a tongue that wraps over and fastens to the outside of the inflatable member. The cover includes an elongated plastic envelope for receiving and covering the inflatable member and a plastic sheet extending from one end of the envelope for covering the tongue. The elongated envelope is provided with a plurality of spaced openings through which the tongue is fastened to the inflatable member.

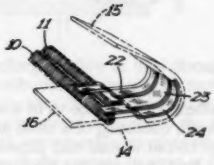
3,654,932
SURGICAL DRAIN FOR SHUNTING FLUID
John B. Newkirk, 2551 East Floyd Avenue, Englewood, Colo.; Paul K. Predecki, 3045 South Clermont Street, Denver, Colo., and Wolff M. Kirsch, 635 Bellaire, Denver, Colo.
Filed Nov. 26, 1969, Ser. No. 880,178
Int. Cl. A61m *27/00*
U.S. Cl. 128—350 V 4 Claims

Hydrocephalus shunt which includes a subcutaneous pump, devoid of rigid or metallic parts, characterized by a one-way slit valve which may be distorted and opened by digital pressure in the plane of the slit to break up and dislodge any particulate matter which may be clogging the valve. The body of the pump includes means for positioning said pump, following subcutaneously implanting thereof, within the body tissue such that the slit is maintained in a



position generally normal to the surface of the cranium. Said means of said pump may include projections which may be sewed to soft tissue beneath the scalp or may include a pump of predetermined cross section such as of oval cross-sectional configuration.

3,654,933
IMPLATABLE ELECTRODE
Norman R. Hagfors, Minneapolis, Minn., assignor to Medtronic Inc., Minneapolis, Minn.
Filed Nov. 18, 1968, Ser. No. 776,348
Int. Cl. A61n *1/04*
U.S. Cl. 128—418 35 Claims



An improved electrode for implantation into a body including one or more electrical conductor leads adapted to be connected to a source of electrical signal, and one or more flexible electrodes attached to the leads, so that the electrodes may be bent around the portion of the body to which they are to make electrical contact. The leads and the portion of the electrode not to be in contact with the body are encapsulated in a substance substantially inert to body fluids and tissue.

3,654,934
TOBACCO SMOKE FILTER
Joseph F. Martin, Painesville, Ohio, assignor to Joseph F. Martin; Marmanac Inc., Cleveland, Ohio and Chemfilt Corp. of America, North Tarrytown, N.Y., part interest to each
Original application Feb. 1, 1967, Ser. No. 613,351, now Patent No. 3,490,462. Divided and this application Oct. 8, 1969, Ser. No. 864,761
Int. Cl. A24b *15/02*
U.S. Cl. 131—267 9 Claims

A tobacco smoke filter and in particular a cigarette filter is disclosed which comprises an absorbent non-tobacco filter

support which carries an impregnation of a hydrocarbon constituted of a normal paraffin having 11 to 18 carbon atoms in the molecular chain. The normal paraffin has the general formula $C_NH_{2N+2}$ and constitutes approximately 1 to 12 percent by weight of the fitter. The hydrocarbon is liquid at ambient temperature and has a vapor pressure not substantially in excess of one millimeter Hg at ambient temperature. The hydrocarbon impregnation may include also a normal paraffin having more than 18 carbon atoms in the molecular chain. The paraffin mixture is likewise liquid.

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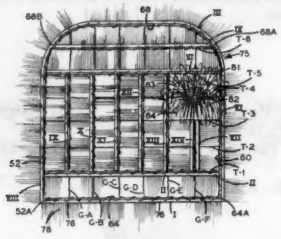
**3,654,935**

**HAIR PROSTHESIS FOR A BALD HEAD AND A METHOD OF MAKING IT AND A METHOD OF SECURING IT**

**Manuel Brown, 95 Marcus Avenue, New Hyde Park, N.Y.**

**Filed May 25, 1970, Ser. No. 40,045**
**Int. Cl. A41g** *5/00*
**U.S. Cl. 132—5** **9 Claims**



A hair prosthesis or hairpiece to fit a measured bald area on a human head, consisting of a mesh network with a contour perimeter thread formed and disposed to lie along the contour of the bald area, with the mesh network having warp and woof loop and lock-stitched threads within the internal space defined by the contour perimeter thread, with the warp and woof threads tied securely at all crossovers to avoid relative slippage of warp and woof threads; and with their wefts fastened to the warp and woof threads and held with preselected lay position thereon; and with anchoring means on the bald head to be fitted, such means consisting of head base rails anchored to a series of growing their tufts in full or part outline around the bald area, with means on the prosthesis, such as Velcro pile sections for anchoring on co-operating Velcro hook sections tied to the head base rails to releasably hold the Velcro pile sections and thereby the hair prosthesis.

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**3,654,936**

**PROCESS FOR STRAIGHTENING HUMAN HAIR**

**Theodor Wajaroff, Darmstadt, Germany, assignor to Wella Aktiengesellschaft, Darmstadt, Germany**

**Filed Oct. 29, 1970, Ser. No. 85,276**
**Claims priority, application Germany, Nov. 6, 1969, P 19 55 823.7**
**Int. Cl. A45d** *7/00*
**U.S. Cl. 132—7** **12 Claims**

Human hair is straightened by a two-stage process wherein the hair is first submitted to the action of a keratin softener and after removal of at least part of the softener from the hair is then treated with a swelling or penetration-promoting agent, while being straightened mechanically. The hair is finally subjected to the action of a fixation or neutralizing agent.

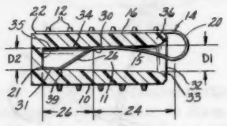
The treatment reduces damage to the hair due to chemical or mechanical action.

**3,654,937**

**HAIR RETAINING DEVICE**

**Fredrick T. Meeks, Asheboro, N.C., assignor to General Electric Company**

**Filed Apr. 29, 1970, Ser. No. 32,977**
**Int. Cl. A45d** *2/14*
**U.S. Cl. 132—40** **6 Claims**



A clip for application to hair curlers of different diameters. The clip comprises two legs joined at one end by an open loop, one of the legs being disposed in a cavity in the curler and having a portion spanning the cavity to contact opposite walls thereby securing the clip to the curler.

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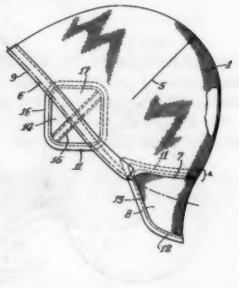
**3,654,938**

**STRETCH WIGS**

**Ross Spangler, and Christine Materre, both of Chicago, Ill., assignors to Helene Industries, Inc., Chicago, Ill.**

**Filed Oct. 7, 1970, Ser. No. 78,846**
**Int. Cl. A41g** *3/00*
**U.S. Cl. 132—53** **6 Claims**



A stretch wig adapted to fit a range of head sizes consists of an elastic mesh fabric wig base having a stiff inelastic frictional stay at the rear edge portion adapted to curve around and engage the nape of the neck to prevent the wig creeping up at the rear. Optionally inelastic stiff stays are provided at the temper portions. The base and stays have hair strands posted thereon to form a wig. The base is cup shaped and is formed by sewing together two or more segments of elastic mesh fabric on substantially radial lines.

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**3,654,939**

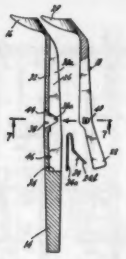
**PIVOTAL CONNECTION FOR PLASTIC PRODUCT**

**Emil Davidson, Scarsdale, N.Y., assignor to Guild Molders, Inc., Elmsford, N.Y.**

**Filed Sept. 14, 1970, Ser. No. 71,913**
**Int. Cl. A45d** *40/26*
**U.S. Cl. 132—88.7** **12 Claims**

A pivotal connection for a plastic product which includes two members wherein one of the members is provided with opposed seating parts forming a pivot seat which seating parts are in flexible walls and the other of the members is formed with opposed pivot pins and camming means such

that the camming means will be effective to flex and spread the walls of the one member to thereby enable the pivot pins



to enter the respective seating parts to hingedly interconnect the two members. In a typical application, the two members may be constructed to form an eyelash applicator.

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**3,654,940**

## METHOD FOR REMOVING RESINOUS OR RUBBER DEPOSITS WITH ORGANIC PEROXIDES

**Jack Ritzi, Hamilton, Ohio, assignor to Chemed Corporation, Cincinnati, Ohio**

**Filed Nov. 25, 1970, Ser. No. 92,837**
**Int. Cl. B08b** *3/08*
**U.S. Cl. 134—2** **9 Claims**

Method for removing resinous and rubber films and other deposits from processing equipment or other coated surfaces comprising first applying to the deposit a catalyzed organic solvent solution of an organic peroxide, then activating decomposition of the peroxide-treated deposit by heating for about 15 minutes to about 4 hours at temperatures of about 100° to about 240° Fahrenheit, and simultaneously or subsequently subjecting the "scorched" deposit to the action of an alkaline aqueous cleaning solution.

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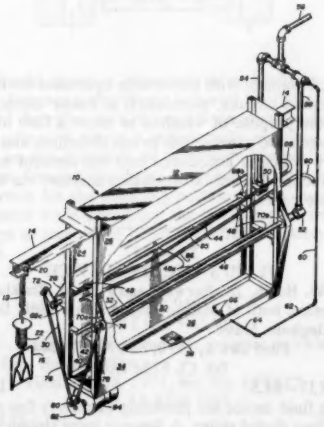
**3,654,941**

## SHACKLE CLEANING SYSTEM

**Janus J. Dillon, Irving, Tex., assignor to Food Equipment, Inc., Dallas, Tex.**

**Filed Apr. 9, 1970, Ser. No. 26,920**
**Int. Cl. B08b** *3/02, 3/10*
**U.S. Cl. 134—59** **5 Claims**



Shackles are transported by an overhead conveyor through a housing. Elongated pipes are disposed on opposite sides of the housing along the path of travel of the shackles, with spray nozzles being positioned along the lengths of the pipes. A source of pressurized fluid is connected to each of the pipes. Each of the pipes are oscillated about a prescribed angle such that oscillating sprays of high pressure fluid are directed against the shackles as they are transported through the housing. Additional sprays are disposed on the bottom of the housing for directing a higher pressure fluid spray upwardly against the shackles. Structure is provided to trip automatic shackles open as they are transported through the housing to facilitate cleaning thereof.

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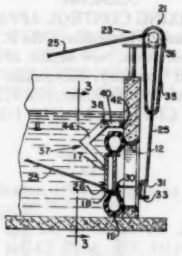
**3,654,942**

## MECHANICALLY LOCATED VALVE AND METHOD OF USING SAME

**Harry E. Mayer, Newberry, S.C., assignor to Mayer Flood Systems Inc.**

**Filed June 8, 1970, Ser. No. 44,442**
**Int. Cl. F16k** *1/20, 31/44*
**U.S. Cl. 137—1** **15 Claims**



A valve for controlling the flow of fluid through a passage defined in a fluid distribution system and the method of using such a valve for controlling fluid flow, for example, to clean the stall area in a barn located adjacent to the passage. The valve includes a fluid impermeable member which is selectively located relative to the passage to prevent fluid flow, or to permit fluid flow at a selected rate through the range from no flow to maximum flow conditions. A resilient, elastomeric sealing member cooperates with the fluid impermeable member in the passage to prevent fluid flow when the valve is in its closed position. Means are provided for selectively locating the position of the fluid impermeable member throughout its range. The locating means include a winch for controlling cable connected to opposite sides of the valve member. In a preferred embodiment, the fluid impermeable member is secured to a vehicle wheel rim on which is mounted a pneumatic vehicle tire. Means are provided to cause the pivoting of the member, rim, and tire as a unit into and out of a sealing relationship with the passage.

A method of using the valve includes the steps of providing a source of fluid, positioning the valve to control the flow of fluid through the passage, and controlling the movement of the valve member to control the flow of fluid. In a preferred embodiment, the method includes the step of cleaning an area adjacent to the valve, for example, the stall area of a barn.

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**3,654,943**

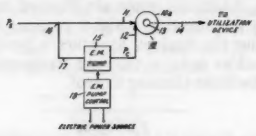
## VORTEX FLUID AMPLIFIER CIRCUIT FOR CONTROLLING FLOW OF ELECTRICALLY CONDUCTIVE FLUID

**Donald L. Rexford, Schenectady, N.Y., assignor to General Electric Company**

**Filed Apr. 8, 1970, Ser. No. 26,503**
**Int. Cl. F15c** *1/16*
**U.S. Cl. 137—9** **5 Claims**

A small electromagnetic pump connected in the control fluid passage of a vortex type fluid amplifier controls the flow

of a pressurized electrically conductive fluid through the vortex fluid amplifier. The use of a second vortex fluid amplifier supplied from the same source of electrically conductive fluid as the first vortex amplifier, and a second small elec-



tromagnetic pump connected in its control fluid passage provides a circuit for controlling the flow to load circuits connected to the outputs of the two vortex amplifiers. A push-pull control of the two pumps produces a desired proportioning of the flows to the load circuits.

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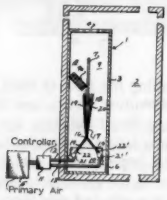
**3,654,944**
**FLUID MIXING CONTROL APPARATUS**
**Richard N. Laakaniemi, Milwaukee; Otto R. Munch, West Allis, and Paul H. Sorenson, New Berlin, all of Wis., assignors to Johnson Service Company, Milwaukee, Wis.**
**Filed Oct. 29, 1969, Ser. No. 872,098**
**Int. Cl. F15c *1/14, 1/16, 1/20***
**U.S. Cl. 137—81.5** **15 Claims**




The present disclosure includes a conditioning air induction unit for conditioning and circulating air in a room. A fluidic amplifier establishes a primary air flow in accordance with room temperature to control the aspiration of the secondary air flow. The fluidic amplifier is an impact modulator, a beam deflector, an inductance device or a vortex device. In all but the latter, the primary flow is vectored into two streams, one directed into a passageway including a coil and the second through a direct air passageway. The primary air streams may be continuously controlled by a mechanical or fluid signal input to control the relative air flow through the two passageways.

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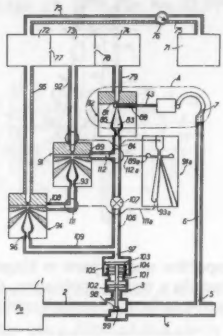
**3,654,945**
**REGULATING DEVICE IN WHICH THE PRESSURE OF A FLUID IS REGULATED**
**Gilles Andre Paul Soviche; Jean Pierre Bues, both of La Celle Saint-Cloud; Cyrille Francois Pavlin, Saclay, and Edouard Maurice Eugene Aime Mace, Saint-Cyr L'Ercole, all of France, assignors to Entreprise de Recherches et D'Activites Petrolieres-Elf, Paris and Bertin & Cie, Plaisir, France**
**Filed Dec. 30, 1969, Ser. No. 889,162**
**Claims priority, application France, Dec. 31, 1968, 182515**
**Int. Cl. F15c *3/14***
**U.S. Cl. 137—81.5** **6 Claims**

An improved regulating device, in which the regulation is effected by regulating the pressure of a fluid the generating pressure of which is variable, wherein the improvement comprises, in combination, a detector of changes in a physical magnitude, displacement of this detector moves by mechanical means a variable obstruction placed at the outlet of a power jet, the output of which is amplified and supplies an



output pressure which controls a pneumatic device acting on the said physical magnitude.

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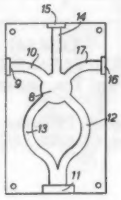
**3,654,946**
**FLUIDIC DIODE**
**Andre Wieme, Zwevegem, Belgium, assignor to N.V. Bekaert S.A., Zwevegem, Belgium**
**Filed June 10, 1970, Ser. No. 45,020**
**Claims priority, application Netherlands, June 17, 1969, 6909193**
**Int. Cl. F15c *4/00***
**U.S. Cl. 137—81.5** **10 Claims**



A switch element with irreversible operation for fluid-controlled logical circuits, particularly a fluidic diode, i.e., an element the purpose of which is to allow a flow of fluid to pass between two connections in one direction, and to channel a flow which is introduced into the element in the opposite direction towards a ventilation aperture via which the fluid then escapes.

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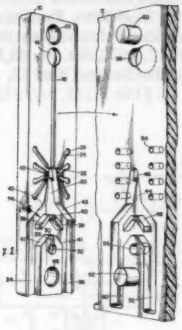
**3,654,947**
**FLUID SWITCHING DEVICE**
**Richard W. Hatch, Jr., Norwell, and Paul M. Blaiklock, Newton Centre, both of Mass., assignors to Fluidic Industries, Inc., Hingham, Mass.**
**Filed Oct. 1, 1970, Ser. No. 77,244**
**Int. Cl. F15c *1/04***
**U.S. Cl. 137—81.5** **13 Claims**

A pure fluid device for providing extremely fast switching between two digital states. A laminar input stream is caused to interact with a control stream within an interaction zone which includes an apertured target through which the input stream flows. In the presence of a control stream, the input

stream is caused to diffuse and distort into engagement with the target, resulting in a rapid reduction in output pressure.



The device features extremely low control flow which permits driving by a single device of a large number of like devices in a logic system.

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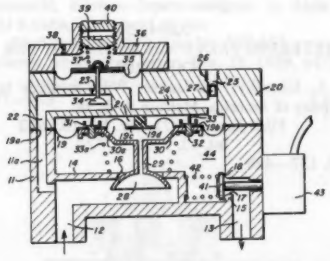
**3,654,948**

**BALANCED PRESSURE REGULATOR**

**Richard E. Nelson, Palos Verdes Peninsula, Calif., assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed Nov. 2, 1970, Ser. No. 86,239**
**Int. Cl. F16k** *31/365*
**U.S. Cl. 137—118** **10 Claims**



A balanced pressure regulator valve having a pressure chamber between a diaphragm actuator for the valve and a portion of the valve stem to provide an inlet pressure in the pressure chamber which is substantially equal to the inlet pressure on the inlet side of the valve. The portion of the diaphragm forming the balancing pressure chamber has a fixed portion for the adjoining portion of the diaphragm to react against while permitting the remaining portion of the diaphragm to respond to outlet pressure to variably position the valve.

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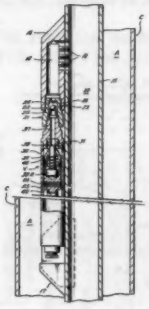
**3,654,949**

**GAS LIFT VALVE**

**Everett D. McMurry, Houston, Tex., assignor to McMurry Oil Tools, Inc., Houston, Tex.**

**Filed Jan. 18, 1971, Ser. No. 107,027**
**Int. Cl. F04f** *1/08*
**U.S. Cl. 137—155** **16 Claims**

There has always been a never ending pursuit of greater efficiency in gas lift operations by which the nearest possible, to optimum amount of gas and of gas pressure energy, is used to lift liquid from wells. One important factor in the never ending pursuit of this goal, is effective control of "valve spread," and convenience of modification of valve spread to accommodate system parameters. This invention is an improvement in gas lift valves, which improvement relates to valve spread in valves embodying "lost motion" features, to



ease and convenience of modification the valve opening and/or valve closing responses, by the combination of "lost motion" valve features with a certain detent means operating between the valve chassis or housing and a valve actuator or carrier.

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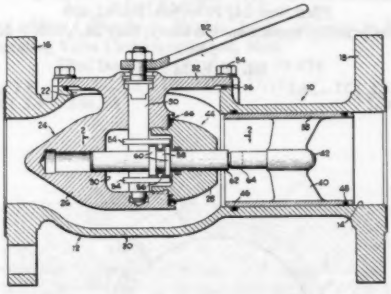
**3,654,950**

**VALVE**

**John R. Hamm, Mentor, Ohio, assignor to Borg-Warner Corporation, Chicago, Ill.**

**Filed Apr. 20, 1970, Ser. No. 29,815**
**Int. Cl. F16k** *1/06, 1/12*
**U.S. Cl. 137—219** **3 Claims**



An axial sleeve valve movable by a toggle mechanism between open and closed positions with respect to an interchangeable shroud cooperates with a pressure energized valve seat carried by the shroud to close the valve for the passage of fluid. The sleeve valve is moved to be slightly spaced from or to barely contact the valve seat which is flexed by the pressure differential created essentially by the position of the sleeve valve, i.e., is pressure energized, to perfect the seal with the sleeve valve. An operating mechanism permits quick operation of the valve and also limits the movement of the sleeve valve when the sleeve valve is moved to its closed position.

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**3,654,951**

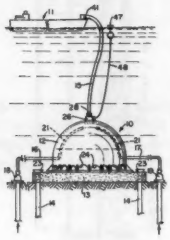
**LIQUID STORAGE FACILITY INCLUDING SELF-ACTUATING DISCHARGE CONDUIT**

**Ivo C. Pogonowski, and Paul D. Carmichael, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.**

**Filed July 1, 1970, Ser. No. 51,426**
**Int. Cl. B65h** *75/38*
**U.S. Cl. 137—355.16** **7 Claims**

The invention relates to an underwater storage facility particularly adapted for holding a hydrocarbon liquid having a

specific gravity less than the specific gravity of water. The facility includes a liquid storage tank fixedly positioned beneath the water's surface usually at the ocean floor. A network of conductors communicates the storage tank with one or more offshore wells whose production is delivered to the



tank. A discharge conduit communicated with said tank, when in operating position extends to the water's surface. When in a non-operating position, the conduit is coiled into a compact bundle at the tank whereby to be beyond the reach of floating vessels, and yet not subject to abrasive wear at the ocean's floor.

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**3,654,952**

**MANHOLE SETUP FOR SEWER SYSTEMS**

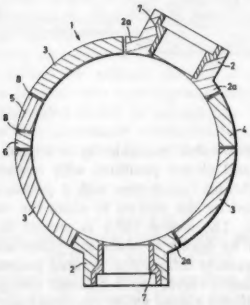
**Harald O. Howe, Ahrstr 40, 5023 Lovenich, and Wolfgang Zaschke, Gobenstr 16, Cologne 1, both of Germany**

**Filed Nov. 24, 1970, Ser. No. 92,409**

**Claims priority, application Germany, May 26, 1970, P 20 25 540.7**

**Int. Cl. E02d** *29/14*

**U.S. Cl. 137—363** **5 Claims**



A manhole setup is provided for sewer systems which consists of at least two connecting points for an inlet and/or an outlet by means of subsequent pipe connecting adapters, such as clay pipes, Manhole rings are mountable on the manhole setup which are characterized in that the manhole setup and wall parts have vertical subdivision. The wall parts are subdivided in wall segments, each having arch length with graduated radians.

**3,654,953**

**VALVE MEANS FOR CONTROLLING DISCHARGE OF WASTE LIQUID INTO PNEUMATIC SEWAGE DISPOSAL SYSTEM**

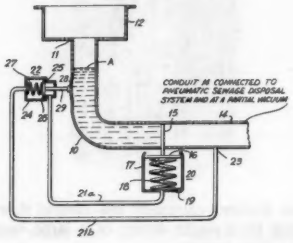
**Manfred Otto Hagdorn, Stockholm, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden**

**Filed Nov. 12, 1970, Ser. No. 88,539**

**Claims priority, application Sweden, Nov. 13, 1969, 15590/69**

**Int. Cl. F16k** *21/18, 31/12*

**U.S. Cl. 137—395** **11 Claims**




Waste liquid is discharged into a pneumatic sewage disposal system from a drain conduit into which such liquid flows from a place in a kitchen or laundry or a fixture in a bathroom like a bathtub or wash basin, for example. A main valve of valve structure, which is operatively associated with the drain conduit for controlling flow of waste liquid into the sewage system, moves from its closed position toward its open position and back to its closed position with increase and decrease, respectively, in the hydrostatic pressure of waste liquid in the drain conduit.

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**3,654,954**

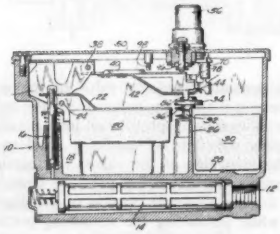
**METERING VALVE ARRANGEMENT FOR OIL CONTROL**

**Harry L. Giwosky, Milwaukee, Wis., assignor to Controls Company of America, Melrose Park, Ill.**

**Filed Jan. 4, 1971, Ser. No. 103,632**

**Int. Cl. F16k** *31/524*

**U.S. Cl. 137—400** **5 Claims**



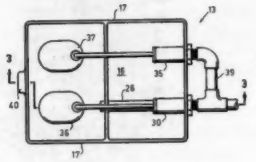
The float controls the inlet valve to maintain a constant level in the float chamber. Flow from the chamber is metered by the stem which is positioned by an idler lever which follows the configuration of the cam carried by a gear segment which is rotated by pinion gear on the lower end of the manually actuated knob. The cam contour is easily controlled and will remain the same in service. The cam is spring loaded against adjusting screws positioned to permit independent adjustment of the low (pilot) and high flow rates. The adjusting screws are respectively accessible and adjustable through the knob when it is in the pilot and high flow positions.

3,654,955

## KINETIC ENERGY CISTERNS

Ronald John Roach, and Graham George Mitchell, both of Blair Athol, Australia, assignors to Gramall Industries Proprietary Limited, Blair Athol, Australia

Filed Dec. 8, 1970, Ser. No. 96,178
Claims priority, application Australia, Dec. 11, 1969, 65124/69
Int. Cl. F16k *31/28*
U.S. Cl. 137—423 5 Claims



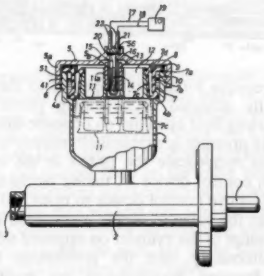
A cistern for connecting to a low pressure hot water supply network containing two float valves, one float valve being positioned above an ejector contained within the cistern and arranged to eject water from the cistern upon opening of that float valve to thereby further lower water level and open that float valve still further, so that kinetic energy of flow of discharge from the float valve is utilised in lieu of elevation of the cistern to provide head for hot water flow, the second float valve being arranged to discharge directly into the cistern after the first has partially opened to thereby prevent hunting of the first float valve.

3,654,956

## SEALED RESERVOIR FOR HYDRAULIC BRAKE SYSTEMS

Kaoru Tsubouchi, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya-shi, Japan

Filed Dec. 22, 1970, Ser. No. 100,633
Claims priority, application Japan, Dec. 25, 1969, 44/1107
Int. Cl. B65d *25/00;* F16l *55/04*
U.S. Cl. 137—558 9 Claims



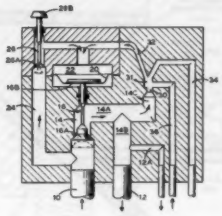
Disclosed herein is a reservoir of a master cylinder for hydraulic brake systems in which a cap is screw threaded over a casing, and the screw threads of the cap and the casing form a spiral air-passageway to communicate atmospheric pressure onto a brake fluid seal. The seal includes a float member and a resilient member having a radially extended annular portion, a thick-walled portion to form a chamber against the casing wall and a vertically expansible portion to hold the floating member at the top end thereof. The chamber between the casing wall and the resilient member stores excess brake fluid as well as contaminants therein and the resilient member lets the float member float up and down in accordance with increases and decreases of the brake fluid quantity so as to maintain constantly good sealing effect.

3,654,957

## FLUIDIC CONTROLLED REFILL SYSTEM

Barry Fichter, Dunellen, N.J., assignor to American Standard Inc., New York, N.Y.

Filed Sept. 16, 1969, Ser. No. 858,326
Int. Cl. F15c *3/06;* F16k *31/145*
U.S. Cl. 137—596.14 11 Claims



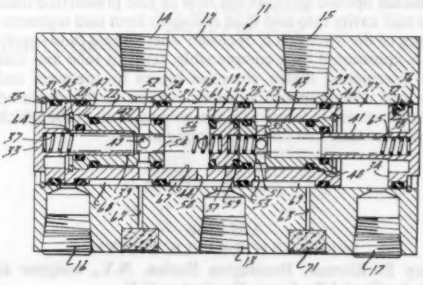
A fluidically controlled refill system which automatically maintains the flow of the refill fluid until a predetermined liquid level or fluid pressure is achieved in the container to be filled. The system includes a diaphragm which interacts with the main valve to hold the valve in the open position during the filling operation, and a fluid switching device which causes the pressure on the diaphragm to decrease in response to predetermined conditions and thus close the main valve.

3,654,958

## SEQUENCE VALVE

Paul A. Bitonti, Dearborn Heights, Mich., assignor to Ross Operating Valve Company, Detroit, Mich.

Filed Dec. 18, 1970, Ser. No. 99,416
Int. Cl. F16k *11/07, 11/10*
U.S. Cl. 137—596.14 7 Claims



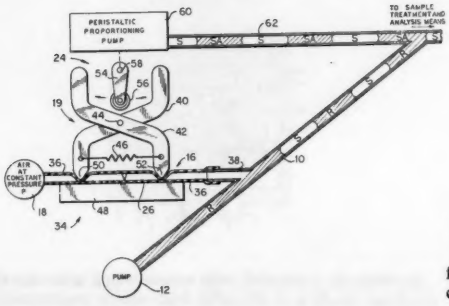
A valve which alternately pressurizes two outlet ports from a single inlet port in response to successive signal pulses at the inlet port. The valve comprises a spool with end chambers and a central spring-controlled shuttle. A plurality of such valves may be stacked to form a series air index, so that the outlet ports will be pressurized in sequence. By altering the construction of one or more valves so that their end chambers can be pressurized only from an external source, a binary counter may be formed from stacked valves, whereby the input signals will pressurize the outlet ports non-serially to pressurize a particular outlet port after a fixed member of input signals.

**3,654,959**

## FLUID SUPPLY CONTROL METHOD AND APPARATUS FOR PERIODIC, PRECISE FLUID MERGER

**Aaron Kassel, Tarrytown, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.**

**Filed Sept. 4, 1970, Ser. No. 69,830**
**Int. Cl. F17d** *1/08;* **F16k** *19/00*
**U.S. Cl. 137—605** **7 Claims**




New and improved fluid supply control method and apparatus for periodic fluid merger which are particularly adapted to the periodic, precisely timed introduction of precisely and uniformly sized fluid segments into a fluid stream are disclosed and comprise a segmenting fluid supply line which respectively connects with a pressurized source of said segmenting fluid at substantially constant pressure and with the line in which said fluid stream is flowing. First and second, quick-acting flow interrupting means are operatively associated with said fluid supply line at spaced locations thereon, and a cavity of substantially constant volume is formed between said flow interrupting means. In operation, and for the formation of each of said segments, said first flow interrupting means are opened to effect the filling of said cavity with said pressurized fluid whereupon said first flow interrupting means are closed and said second flow interrupting means opened to effect the flow of said pressurized fluid from said cavity into said fluid stream to form said segments. A form of the invention is disclosed wherein said fluid supply line is constituted by a compressible, resilient tube and said flow interrupting means comprise means to compress and close said tube at spaced locations thereon. In this disclosed form, the cavity is formed by the volume of the tube which extends between said flow interrupting means.

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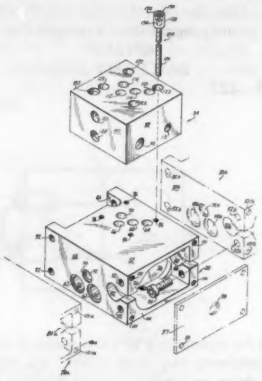
**3,654,960**

## MODULAR HYDRAULIC SYSTEM

**Henry E. Kiernan, Huntington Station, N.Y., assignor to Hydro-Stack Mfg. Corp., Huntington, N.Y.**

**Filed Dec. 31, 1969, Ser. No. 889,524**
**Int. Cl. F17d** *1/00*
**U.S. Cl. 137—608** **17 Claims**

A modular hydraulic system is provided. Each of the components of the system is contained in a generally rectangular housing unit formed of a plurality of opposed pairs of walls including end walls, front and rear walls, and top and bottom walls. At least one passageway extends into each unit between the component and at least one of the walls of that unit. One of the walls of each opposed pair is adapted to be coupled to the other wall of the corresponding pair of another unit of the system with the walls in surface-to-surface contact and the passageways terminating on the abutting walls in aligned registry. The units are coupled to one another by means of a plurality of fasteners with each



fastener passing partially through each of the housings to be coupled.

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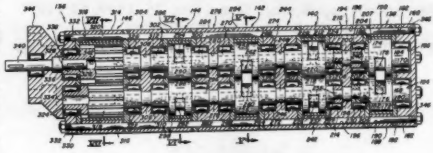
**3,654,961**

## ROTARY PERCUSSION DRILL HAVING A HYDRAULICALLY ACTUATED PERCUSSION DEVICE

**Albert Phillips, 465 Kiwanis Avenue, Morgantown, W. Va.**

**Original application Mar. 14, 1969, Ser. No. 807,388, now Patent No. 3,547,206, dated Dec. 15, 1970. Divided and this application July 31, 1970, Ser. No. 60,023**
**Int. Cl. F15b** *21/02*
**U.S. Cl. 137—624.13** **9 Claims**



The percussive forces are imparted to the drill rod by a hydraulically actuated reciprocating piston housed in a cylinder having fluid openings on opposite sides of the piston. Fluid under pressure is supplied alternately to the respective openings to reciprocate the piston in the cylinder from a multi-valve control device. A timing mechanism is included in the multi-valve control device to open and close the valve ports within the valve to supply pressurized fluid alternately to the openings in the cylinder on opposite sides of the piston and to alternately vent the pressurized fluid from the cylinder. Pressure accumulators are employed as surge devices for excess fluid supplied to the cylinder for each stroke of the piston.

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**3,654,962**

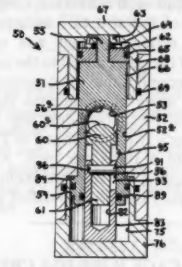
## VALVES

**John V. Fredd, Celina, and Jack W. Tamplen, Dallas, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.**

**Filed Oct. 3, 1969, Ser. No. 863,524**
**Int. Cl. F16k** *5/02, 5/04, 5/06, 11/14*
**U.S. Cl. 137—625.11** **68 Claims**

Valves of the sliding gate and rotary plug types having a body with inlet and outlet ports, an apertured closure as-

sembly controlling flow therethrough including a primary closure member and a secondary closure member, and a soft seal means surrounding at least one of said ports and sealing between the body and the closure assembly, said secondary



closure member co-acting with said primary closure to close said aperture means of said closure assembly prior to movement of said aperture means past said seal means to maintain effectiveness of said seal means between the body and closure assembly. Single and multiple port sliding gate valves and cylindrical, tapered, and ball type plug valves provided with such closure assemblies are disclosed.

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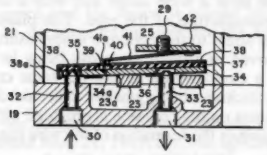
**3,654,963**

## ELECTRIC CONTROL VALVE

**Frederik J. Ages, Rolling Hills Estates, Calif., assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed May 4, 1970, Ser. No. 34,226**
**Int. Cl. F16k *31/06***
**U.S. Cl. 137—625.65** **1 Claim**



A relay operated valve wherein a rectangular armature is pivoted intermediate its ends on a side edge of a U-shaped magnet core near its open end and is rockable to selectively engage one or the other of two valve seats. An L-shaped leaf spring has its long leg extending generally parallel to the armature and an end thereof fixed on the valve body, with the short leg thereof extending substantially at a right angle from the other end of the long leg and into a transverse groove in the armature to yieldably pivot the armature away from the magnet and into engagement with one of the valve seats and to operably hold the armature in the valve.

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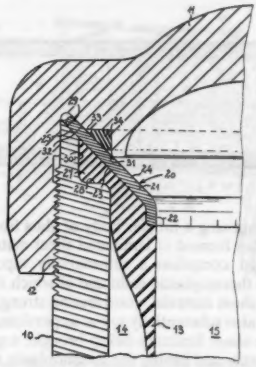
**3,654,964**

## PRESSURE VESSELS

**Jean Mercier, 501 Bloomfield Avenue, Caldwell, N.J., and Jacques H. Mercier, 49 Rue de Naples, Paris, France**

**Filed Feb. 20, 1970, Ser. No. 13,089**
**Claims priority, application France, Mar. 3, 1969, 690563**
**Int. Cl. F16l *55/00***
**U.S. Cl. 138—30** **11 Claims**

The present invention relates to a pressure vessel in the form of a container having an enlarged mouth with an externally threaded outer periphery. A cover member having a depending internally threaded wall portion is adapted to be screwed onto the threaded mouth of the container, the cover member and the container having ports leading thereinto. A deformable partition in said container divides the latter into two variable volume chambers in communication respectively with said ports, said deformable partition having a mouth which is secured to a portion of a thin annular supporting member of resilient material, said supporting member having



an additional portion extending outwardly from said first portion and two concentric annular zones of retention are provided for said additional portion of said annular supporting member, the innermost annular zone providing a resilient seal and the outermost annular zone providing rigid retention of the outer periphery of said annular supporting member.

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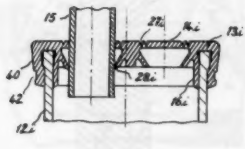
**3,654,965**

## CLOSURE MEMBERS FOR PIPE SECTIONS

**Jean Charles Marie Gramain, Paris, France, assignor to Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes, Colombes, France**

**Continuation-in-part of application Ser. No. 737,500, June 7, 1968, now abandoned. This application June 1, 1970, Ser. No. 42,308**
**Claims priority, application France, June 25, 1967, 111805; Oct. 12, 1967, 124,310**
**Int. Cl. F16l *55/10***
**U.S. Cl. 138—89** **2 Claims**

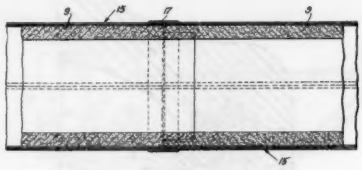


This invention relates to closure members for closing the open end of a pipe section which is so arranged that it will allow the connection of a pipe having a diameter less than that of the pipe section. The closure member itself comprises a plug which has means incorporated therewith to limit axial movement and thus the depth of its passage into the open end of the pipe section and also resilient joint means for application to the internal wall of this open end. The plug also includes diaphragm means composed of an easily cuttable material so that a pipe can be passed therethrough that has a diameter less than that of the open end of the pipe section to which it is to be connected.

## 3,654,966
## JACKETED FIBROUS DUCT

David Waksman, Roeland Park, Kans., assignor to Certain-Feed Saint Gobain Insulation Corporation, North Bala Cynwyd, Pa.

Filed Jan. 26, 1970, Ser. No. 5,537
Int. Cl. F16l 9/14
U.S. Cl. 138—141 8 Claims

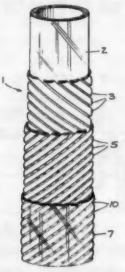


A duct comprising a tubular body of glass fibers and a surrounding jacket formed of laminated sheet material of which the inner layer comprises a substantially vapor impervious heat sealable thermoplastic resin and of which the outer layer is formed of sheet material, contributing strength to the joint and which is also substantially vapor impervious, the opposite edges of the sheet laminate being brought together around the tubular body and having the thermoplastic resin layers of said opposite edges heat sealed together. A method for applying the jacket is also disclosed, comprising heat sealing edge portions of the jacket together to form a slack loop larger than the perimeter of the duct body, assembling the loop and duct body and thereafter tightening the slack loop on the body by a further heat sealing operation.

## 3,654,967
## TEXTILE-REINFORCED ALL-POLYMERIC HOSE AND METHOD OF MAKING SAME

William J. Atwell, Bloomingdale, and Lawrence Cranston, Ramsey, both of N.J., assignors to Uniroyal, Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 818,236, Apr. 22, 1972, now abandoned. This application July 17, 1970, Ser. No. 55,784
Int. Cl. F16l 9/14
U.S. Cl. 138—144 7 Claims



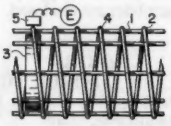
An all-polymeric textile-reinforced hose particularly suited for pressure service, typically an all-nylon hose, and a method of making same are disclosed. The hose comprises an inner thermoplastic tube, two or more successive layers of thermoplastic textile reinforcement wound helically (spirally), each successive helically disposed reinforcing layer being disposed oppositely to the preceding layer, and a polymeric outer protective jacket. The innermost reinforcing layer is fused to the inner tube and successive reinforcing layers are fused to one another. This fusion is typically accomplished by softening with a resorcinol-water solution followed by juxtaposition of the components to be joined after which the resorcinol softening agent is removed with a water bath. Before the outer polymeric jacket is applied, the assembly is softened with a softening agent which is thereafter removed; this effects activation of the plastic in the outer helical textile layer and such activation, coupled with the activation in the rest of the structure as a result of previous treatments with a softening agent and removal thereof, enhances bonding of the outer jacket to the assembly.

The textile reinforcement may be constituted by synthetic multifilament yarns made of continuous thermoplastic filaments, having a total twist (including any so-called producer's or manufacturer's twist) of from 0 to 15 turns per inch, preferably from 1 to 5 turns per inch. Alternatively, but generally less preferably, the reinforcement may be formed of thermoplastic staple yarns or of so-called monofils.

## 3,654,968
## STEEL WIRE CAGE WIRE FOR CHEMICALLY PRESTRESSED CONCRETE PIPE

Katsuhisa Mizuma, Fujisawa, Japan, assignor to Koushuha-Netsuren Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 18, 1970, Ser. No. 12,363
Claims priority, application Japan, Mar. 13, 1969, 44/18571
Int. Cl. F16l 9/08
U.S. Cl. 138—176 5 Claims

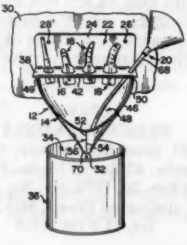


A wire used in the wire cage of chemically prestressed concrete pipe is effective to restrain the expansion of expansion concrete over a wide range and with a uniform stress during the manufacture of the pipe. The plane of the wire which applies stress to the concrete is approximately straight or mildly curved in section, its width being larger than the diameter of a circular wire having the same cross sectional area and its thickness being smaller than said diameter. The plane which acts on the concrete is provided with projections for spot welding in the formation of the wire cage.

## 3,654,969
## OIL CAN OPENER DRIP COLLECTOR

Eugenio A. Vazquez, and Manuel Barcia, both of 2741 S.W. 1st Street, Miami, Fla.

Filed Nov. 3, 1969, Ser. No. 873,594
Int. Cl. B67c 11/00
U.S. Cl. 141—106 4 Claims



For use in automobile service stations, a collector for can opening spouts, which includes a funnel, shelf means having seats to hold the can opening and pouring spout tools, in

close proximity to the mouth of the funnel, said seats having through holes so that drops of oil from the tools will drip through the funnel to a collector vessel positioned beneath it, and a mounting structure holding the shelf and the funnel together and adapting the same for attachment to a wall surface or placement on a horizontal support surface for convenient positioning in a filling station.

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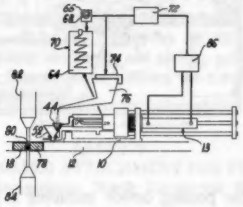
**3,654,970**
**DEVICE FOR FEEDING POWDERED MATERIAL**
**Albert Teboul, Lapalud, France, assignor to Commissariat A L'Energie Atomique, Paris, France**
**Filed Apr. 27, 1970, Ser. No. 32,178**
**Claims priority, application France, Apr. 30, 1969, 6913828**
**Int. Cl. B67c** *3/26;* **B67d** *5/00*
**U.S. Cl. 141—284** **6 Claims**



A device for automatically supplying successive charges of powder to the die of a press, comprises a spoon carried by a flexible strip fitted with a strain gage associated with an apparatus for continuous weighing of the spoon and a vibratory feeder for pouring the powdered material progressively into the spoon. When the total weight of the powder and spoon attains a predetermined value, the flow of powder into the spoon is stopped and the spoon is moved forward and inverted so as to discharge its contents into the die chamber.

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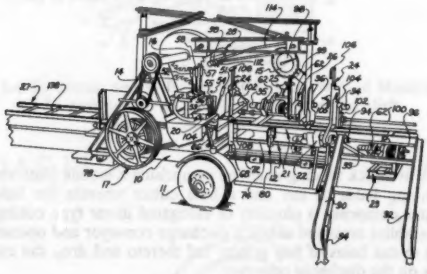
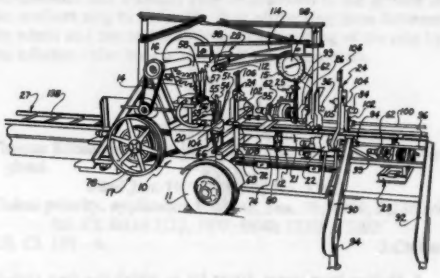
**3,654,971**
**SAWMILL**
**Frank H. Pryor, Angle Street, Fredericksburg, Ohio**
**Filed Mar. 21, 1969, Ser. No. 809,246**
**Int. Cl. B27b** *7/00, 31/00*
**U.S. Cl. 143—52 R** **12 Claims**



A sawmill of the type which can be controlled by a single operator from a central control station which is characterized by a novel conveyor apparatus which is uniquely adapted for three-way delivery of sawn boards from a cutting station. The sawmill is further characterized by a remote control apparatus that enables the operator to selectively deliver sawn timbers from either side of the discharge end of said conveyor or, if desired, straight from the end of the conveyor in the direction of axial extent thereof.

**3,654,972**
**SAWMILL**
**Frank H. Pryor, Angle Street, Fredericksburg, Ohio**
**Filed Mar. 21, 1969, Ser. No. 809,169**
**Int. Cl. B27b** *7/00, 29/10*
**U.S. Cl. 143—52** **1 Claim**



A sawmill of the type which can be controlled by a single operator from a central control station which is characterized by a plurality of timber handling devices including a timber supporting carriage mounted on a track means for delivering timbers to a cutting station, as well as apparatus for conveying sawn boards, all of which are hydraulically operated and controlled from said station. Said apparatus is further characterized by a conveyor means including an axis of delivery substantially co-extensive with the path of movement of said log supporting carriage along said track means.

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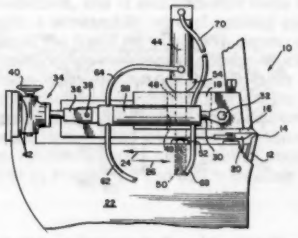
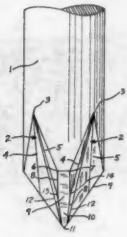
**3,654,973**
**HYDRAULICALLY CONTROLLED PRESSURE CAP**
**Louis J. Koss, Carmel, Ind., assignor to Capital Machine Company, Inc., Indianapolis, Ind.**
**Filed Oct. 19, 1970, Ser. No. 81,684**
**Int. Cl. B27l** *5/06*
**U.S. Cl. 144—178** **11 Claims**



In a veneer slicer including a knife having a cutting edge, a knife carrier, a pressure bar, and a carriage or pressure cap for the pressure bar, the carriage being movable relative to the knife carrier and arranged to hold the pressure bar in a predetermined spaced relationship relative to the cutting edge, the improvement comprising first fluid motor means for moving the carriage to move the pressure bar toward and away from the knife, clamping means, and second fluid motor means for operating the clamping means to clamp the carriage in a selected position to hold the pressure bar in a selected position relative to the cutting edge.

3,654,974
SCREW DRIVERS
Bertron Otis Barnes, 6054 Claremont Avenue, Oakland, Calif.
Filed Apr. 8, 1970, Ser. No. 26,657
Int. Cl. B25b 15/00
U.S. Cl. 145—50 A 1 Claim



A Phillips type screw driver bit in which the four radially extending vanes at the bit end of the screw driver shank are provided with wall portions near the apex of the bit that will contact with the adjacent wall surfaces in the cruciform slot in the screw when the bit is inserted into the cruciform slot. The point of novelty lies in providing the wall portions of the vanes with relieved areas that will be spaced from the adjacent wall surfaces in the cruciform slot that lie at the top surface of the screw head. In other words, when the screw driver bit is seated in the cruciform slot in the screw, the relieved portions of the side walls of the vanes will be spaced from the adjacent surfaces of the cruciform slot so that there can be no contact between these opposed surface portions and the upper portion of the cruciform slot (in the screw head) cannot become marred or damaged.

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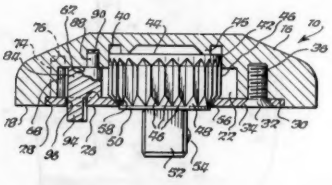
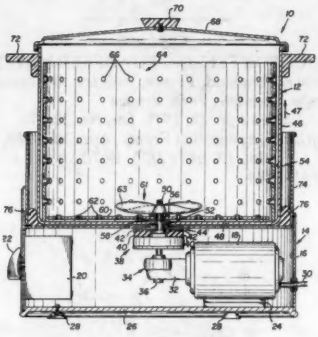
3,654,975
AUXILIARY TOOL HANDLE
George C. Ballsmith, 243 Forbes Avenue, and Richard C. Knoche, 6 Maple Street, both of Tonawanda, N.Y.
Filed Sept. 5, 1969, Ser. No. 855,581
Int. Cl. B25g 1/00, 3/24
U.S. Cl. 145—75 1 Claim



An auxiliary tool handle for attachment to the free end of a hand operable, rotatable tool comprises a body having a cavity therein for receiving a ratchet mechanism. A cover plate closes the cavity and covers the ratchet mechanism. The ratchet mechanism comprises a rotatable circular disc member having teeth about the periphery thereof and an axial extension projecting through the cover plate for insertion in a corresponding recess of the regular handle of a tool. A pair of pawl members are mounted in the cavity of the body and are normally biased by springs into driving engagement with the teeth of the disc member. A pivoted cam member having an operating portion projecting through the cover plate is operative selectively to move either of the pawl members out of teeth engaging position to determine the direction of rotation of the body relative to the disc member.

3,654,976
PEELING DEVICE
Louis H. Loeffler, 1247 Minerva Avenue, W. Islip, N.Y.
Filed Feb. 26, 1970, Ser. No. 14,532
Int. Cl. A23n 7/02
U.S. Cl. 146—49 B 9 Claims



A vegetable peeling device including a pot-like housing unit effectively containing a rotary and a relatively stationary cooperating arrangement of peeling members, wherein the drive for said rotary member is readily completed when said unit is placed in a seated position on a stand, and yet said unit is readily movable from said stand, for transport to a work or cleaning station.

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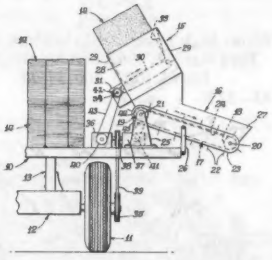
3,654,977
LIVESTOCK FEEDING MACHINE
Edward L. Benno, Route 1, P.O. Box 198, Grayslake, Ill.
Filed Mar. 17, 1970, Ser. No. 20,269
Int. Cl. A01f 29/00, 31/00
U.S. Cl. 146—70.1 2 Claims



A livestock feeding machine comprising a mobile platform carrying bales of hay and a bale cutter wherein the bale cutter comprises a plurality of elongated linear type cutting assemblies arranged above a discharge conveyor and operating to cut bales of hay gravity fed thereto and drop the cut hay on the discharge conveyor.

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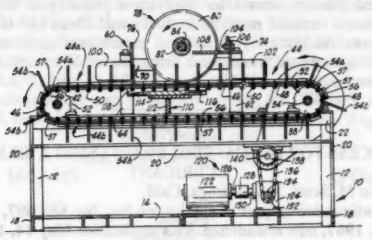
3,654,978
POWERED CUTTER APPARATUS
Floyd S. Gabel, 5008 N.W. Steason, Oklahoma City, Okla.
Filed Sept. 29, 1969, Ser. No. 861,771
Int. Cl. B26d 1/28
U.S. Cl. 146—98 5 Claims

A powered machine for slicing bulk meat into relatively thin slices, the machine including a framework which carries rotatably mounted, spaced, disk cutter elements, and stripper

fingers which project between the cutter elements and prevent the sliced meat from being diverted by the cutter elements from an intended path of travel. An endless conveyor



is movably mounted on the framework for moving the bulk meat into the cutter elements, and sliding guide plates are mounted on the framework to position the meat on the conveyor before and after slicing.

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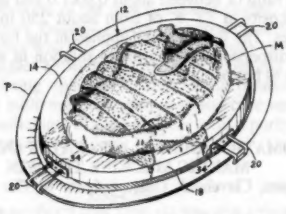
**3,654,979**

**CARVING BOARD ATTACHMENT FOR PLATTER**

**Raymond A. Montgomery, North Racebrook Road, Woodbridge, Conn.**

**Filed Sept. 24, 1970, Ser. No. 75,069**
**Int. Cl. A47j** *43/18*
**U.S. Cl. 146—215** **5 Claims**



Carving board attachment has flat upper and lower faces for easy use, cleaning, and storage. Outward hooks hold it firmly in place on a serving platter.

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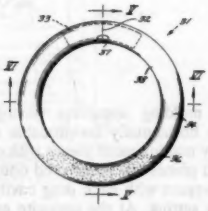
**3,654,980**

**BEAD SEATER**

**Ian K. Rosen, and William C. Holmgren, both of Muskegon, Mich., assignors to AGSRAD, Inc., Muskegon, Mich.**

**Filed Jan. 26, 1970, Ser. No. 5,728**
**Int. Cl. B60c** *25/12*
**U.S. Cl. 157—1.1** **3 Claims**



A bead extending resilient ring, one portion of which offers less resistance than the balance of the ring to provide a selected differential local resistance. An extruded resilient ring having a seam formed by abutting the two ends of an extruded cross section and wherein the portion at or adjacent the seam provides a differential resiliency whereby the extender gasket formed by the ring is guidably moved when radial and axial pressures are applied to the ring. Several cross sections and surface treatments are indicated which provide superior performance in controlling the movement of the extender and a dimple may be provided in the surface of the resilient ring to index the flow of the ring from between the wheel and tire and in avoidance of scuffing of the ring by the inflation valve base where scuffing is a problem.

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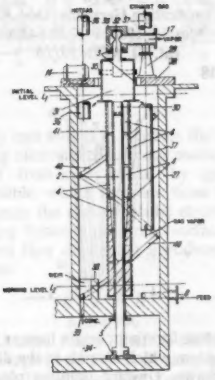
**3,654,981**

**EVAPORATORS**

**Thomas Edmondston Aitchison, 86 Upper Park, Harlow, England**

**Filed Jan. 19, 1970, Ser. No. 3,803**
**Claims priority, application England, Jan. 30, 1969, 5,238/69**
**Int. Cl. B01d** *1/22, 1/00;* **B04b** *15/08, 15/02*
**U.S. Cl. 159—6** **3 Claims**



An evaporator comprises an enclosure which receives liquid for evaporation, and in said enclosure there is set up by rotor means a substantially vertical rotating cylindrical vortex column of the liquid surrounded by a gaseous medium. The column is either contained in a sleeve which rotates with the column and the rotor, or has an outer surface, without any rigid surround, in open contact with the gaseous medium. The column is vaporized by heat transferred to it from the gaseous medium, and the vapor is conducted from the enclosure. Additional liquid is fed into the enclosure to replace that lost by evaporation and thus to maintain the vortex column.

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**3,654,982**

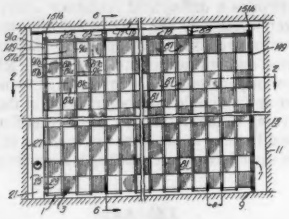
**PROTECTIVE GRILLE**

**Henri Marcel Robert Labelle, Greenfield Park, Quebec, Canada, assignor to Dynaflair Corporation Ltd., Pointe Claire, Quebec, Canada**

**Filed May 18, 1970, Ser. No. 38,286**
**Claims priority, application Canada, Nov. 7, 1969, 067029**
**Int. Cl. E05d** *15/26*
**U.S. Cl. 160—199** **12 Claims**

A folding closure having an open pattern curtain formed from a plurality of rods and panels interconnected together. The curtain is movable between open and closed positions supported by an extensible hinge. The hinge is constructed to permit the curtain to follow a curved track when in the open or folded position. Both the hinge and curtain are supported

by frames in the opening to be closed, some of which have a reversible wall panel permitting the frame to be used at different locations to support the curtain either at its ends or intermediate its ends.



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**3,654,983**

**DEVICE FOR FORMING PLEATS ON CURTAINS**

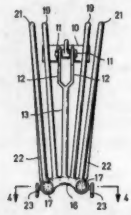
**Wilhelm Hachtel, 6994 Niederstetten, Germany**

**Continuation of application Ser. No. 770,612, Oct. 25, 1968, now abandoned. This application Sept. 15, 1970, Ser. No. 72,518**

**Claims priority, application Germany, Dec. 30, 1967, H 64 926; May 18, 1968, P 17 78 643.5**

**Int. Cl. A47h** *13/16*

**U.S. Cl. 160—348** **11 Claims**



A one-piece pleat forming curtain hanger has a stiff crossbar on a hanging arm which extends in the direction in which the curtain is drawn. Upward pointing pleat-holding arms, forwardly extending horns, and optionally, hooking devices all extend from the crossbar.

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**3,654,984**

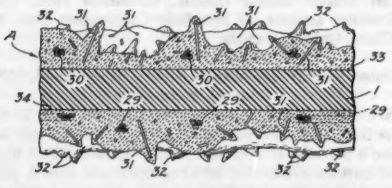
**PORCUPINE SHELL MOLDS AND METHOD OF MAKING SAME**

**Edward J. Mellen, Jr., East Cleveland; Edmond M. Baker, Minerva, and John M. Webb, Chagrin Falls, all of Ohio, assignors to said Mellen, by said Baker and said Webb**

**Continuation-in-part of application Ser. No. 781,069, Dec. 4, 1968, now Patent No. 3,508,602, Original application Dec. 2, 1965, Ser. No. 511,129, now Patent No. 3,452,804. Divided and this application Jan. 27, 1970, Ser. No. 6,241**

**Int. Cl. B22c** *9/12*

**U.S. Cl. 164—26** **5 Claims**



A thermally insulated, unbacked, procupine shell mold made by applying to a wax pattern a series of layers of ceramic material, adhering to the ceramic layers in a single application a multiplicity of stiff destructible threadlike fibers with a length of about 0.4 inch to about one inch, said fibers being randomly disposed to project outwardly in closely spaced relation, thereafter applying a plurality of layers of additional ceramic material to cover said fibers and to cause the outer ceramic layers to form projections conforming to the shape of said fibers, and firing the mold to remove the wax and burn out said fibers.

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**3,654,985**

**PROCESS FOR DIE CASTING BRASS USING A SILICONE LUBRICANT**

**Edwin M. Scott, Jr., Tujunga, Calif.**

**Continuation-in-part of application Ser. No. 684,497, Nov. 20, 1967, now abandoned. This application May 14, 1970, Ser. No. 37,340**

**Int. Cl. B22c** *3/00*

**U.S. Cl. 164—72** **8 Claims**

The invention solves a persistent problem in die casting of brass alloys, wherein lubrication of the steel die or mold is generally difficult. In accordance with the invention, the surfaces of the mold to come in contact with the molten brass are coated with a film of a phenyl methyl silicone fluid which is a linear polymer having repeating units of the element

wherein $R_1$ is methyl and wherein $R_2$ is chosen selectively to be methyl or phenyl so that the resulting polymer has a phenyl-methyl ratio of between about 0.60:1.0 and about 0.85:1.0 and a viscosity at 77° F. of from about 250 to about 1,000 centistokes. The fluid may be applied in the form of a dilute aqueous dispersion, or as a dilute solution in a suitable solvent such as petroleum naphtha.

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**3,654,986**

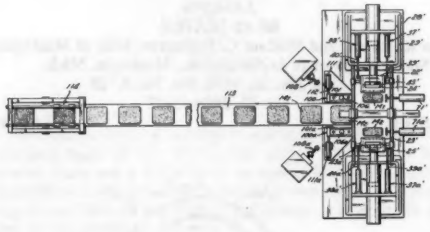
**AUTOMATIC MOLDING APPARATUS AND MOLD-MAKING MACHINE THEREIN**

**Karl Jansen, Cleveland, Ohio, assignor to The Austin Company**

**Filed June 19, 1970, Ser. No. 47,715**

**Int. Cl. B22c** *15/08*

**U.S. Cl. 164—173** **16 Claims**



Automatic molding apparatus having a mold making machine with horizontally reciprocable operating parts for simultaneously making mold pieces with cope and drag cavities. The mold pieces are transferred onto one end of a conveyor or conveyors with each drag cavity facing upward to facilitate core setting. At the opposite end of the conveyor the mold pieces are stacked for pouring with the cope cavity in one facing downwardly and registering with the upwardly facing drag cavity in another.

3,654,987

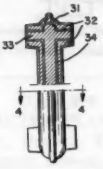
## GASIFIABLE CASTING CARE

Adalbert Wittmoser, Lampertheim, Germany; Johnannes Schade, Petit-Lancy-Geneve, Switzerland, and Erich Krzyzanowski, Ludwigshafen (Rhine), Germany, assignors to Full Mold Process, Inc., Lathrup Village, Mich.

Original application Nov. 1, 1966, Ser. No. 615,866, now Patent No. 3,498,360, which is a division of application Ser. No. 298,678, July 30, 1963, now Patent No. 3,314,116, which is a continuation-in-part of application Ser. No. 270,085, Apr. 2, 1963, now abandoned. Divided and this application Aug. 8, 1969, Ser. No. 871,096

Int. Cl. B22c *9/10, 7/02*

U.S. Cl. 164—369 3 Claims




A casting pattern disposed in a molded material and having the configuration of the article to be cast. A core member is located within the outer body member and has the configuration of a cavity to be formed and the casting. The outer body member and the core member are each composed of a material gasifiable substantially without residue upon being subjected to the elevated temperature of a molten casting charge. A first layer of refractory gas permeable material covers the outer body member and remains solid at the elevated temperature of the molten casting charge. A second layer of refractory material covers the entire outer surface of the core member which is exposed to the body member for preventing contact between the casting charge and the core member and being operative to retard the transmission of heat from the molten casting charge to the core member to prevent the gasification of core member until a portion of the metal adjacent the second layer has solidified.

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3,654,988

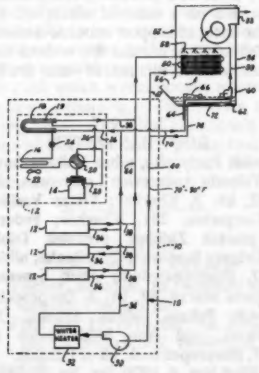
## FREEZE PROTECTION FOR OUTDOOR COOLER

John B. Clayton, III, Shaker Heights, Ohio, assignor to American Standard Inc., New York, N.Y.

Filed Feb. 24, 1970, Ser. No. 13,498

Int. Cl. F25b *29/00*

U.S. Cl. 165—17 3 Claims



A room heating-cooling system of the type wherein a water loop extends through a plurality of room air conditioning units to exchange heat therewith, said water loop comprising an outdoor evaporative cooler and an indoor water heater: the improvement comprising branch water lines connecting the water loop with a heat exchange coil in the sump of the evaporative cooler for keeping the sump liquid above freezing level when the outdoor temperature drops below 32° F.

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3,654,989

## APPARATUS FOR COOLING CONTINUOUS CASTINGS

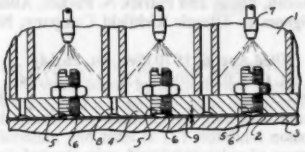
Walter Meier, Winterthur; Max Burkhardt, Zurich, and Armin Thalmann, Uster, all of Switzerland, assignors to Concast AG, Zurich, Switzerland

Filed May 28, 1970, Ser. No. 41,203

Claims priority, application Switzerland, May 30, 1969, 8229/69

Int. Cl. B22d *11/12*

U.S. Cl. 165—47 9 Claims



A continuously cast strand as it leaves the casting mold is cooled by cooling elements comprising cooling plates having surfaces spaced from the strand by guide elements, preferably adjustable, which protrude from the surfaces of the plates to engage the surface of the strand and establish and maintain a gap between the strand surface and the plate surfaces to permit flow of coolant introduced into the gap through said plates.

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3,654,990

## HYDRAULIC FRACTURING METHOD

Bobby G. Harnsberger, and Joy T. Payton, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed June 19, 1970, Ser. No. 47,878

Int. Cl. E21b *33/138*

U.S. Cl. 166—281 3 Claims

An improved method of fracturing an underground fluid bearing formation penetrated by a well bore for the production of fluids therefrom by injecting a composition capable of forming a fluid permeable barrier in said formation at a pressure sufficient to form fissures therein extending from said well bore, and thereafter maintaining pressure on the composition for a predetermined period to permit the composition to set and form a fluid permeable barrier in the formed fissures.

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3,654,991

## FRACTURING METHOD

Bobby G. Harnsberger, and Joy T. Payton, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed June 19, 1970, Ser. No. 47,879

Int. Cl. E21b *33/138*

U.S. Cl. 166—281 8 Claims

An improved method of fracturing an underground fluid bearing formation penetrated by a well bore for the production of fluids therefrom by injecting a composition comprising cement, sand and oil, capable of forming a fluid permeable barrier in said formation at a pressure sufficient to form fissures therein extending from said well bore, and thereafter maintaining pressure on the composition for a predetermined period to permit the composition to set and form a fluid permeable barrier in the formed fissures.

## 3,654,992
## FRACTURING METHOD

**Bobby G. Harnsberger, and Joy T. Payton, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.**

**Filed June 19, 1970, Ser. No. 47,880**
**Int. Cl. E21b** *33/138*
**U.S. Cl. 166—281** **3 Claims**

An improved method of fracturing an underground fluid bearing formation penetrated by a well bore for the production of fluids therefrom by injecting a composition capable of forming a fluid permeable barrier in said formation at a pressure sufficient to form fissures therein extending from said well bore, and thereafter maintaining pressure on the composition for a predetermined period to permit the composition to set and form a fluid permeable barrier in the formed fissures.

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## 3,654,993
## METHOD FOR INHIBITING CORROSION IN A WELL

**Frank W. Smith, Plano, and Patrick N. Parker, Allen, both of Tex., assignors to Atlantic Richfield Company, New York, N.Y.**

**Filed Apr. 6, 1970, Ser. No. 26,144**
**Int. Cl. C02b** *5/06;* **C23f** *11/10, 11/14*
**U.S. Cl. 166—279** **17 Claims**

A corrosion inhibiting composition containing, inter alia, (1) a corrosion inhibitor, (2) at least one material selected from the group of polyacrylic acid, salts thereof, hydrolyzed polyacrylamide, salts thereof, and certain organophosphorus compounds, and (3) at least one acid including and/or in addition to polyacrylic acid if present. A method for treating a well wherein the composition is injected into a subterranean geologic formation and the pH of the composition is raised to cause the formation of a precipitate in situ in the formation.

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## 3,654,994
## FRICTION REDUCING IN FLOWING HYDROCARBON FLUIDS

**Robert Clayton Slagel, Pittsburgh, and Arnold Eugene Bloomquist, Bethel Park, both of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.**

**Filed Aug. 6, 1970, Ser. No. 61,852**
**Int. Cl. C10m** *7/26;* **E21b** *43/26;* **F17d** *1/16*
**U.S. Cl. 166—308** **12 Claims**

This disclosure is directed to a method and composition useful in reducing the friction loss in flowing hydrocarbon fluids. The composition is an emulsion consisting essentially of a homopolymer or copolymer of

where "$R_1$" is H or $CH_3$ and "$R_2$" is an alkyl group of eight to 18 carbon atoms, a glycol and water. The method comprises mixing the emulsion with the hydrocarbon fluid and then adding a lower alkyl alcohol which causes the polymer to be transferred from the emulsion phase to a hydrocarbon solution.

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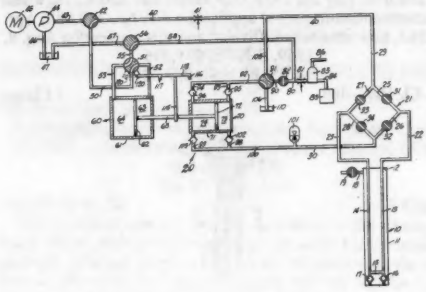
## 3,654,995
## FLUID CIRCULATING METHOD AND SYSTEM FOR WELLS

**Phillip S. Sizer, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.**

**Filed July 8, 1970, Ser. No. 53,186**
**Int. Cl. E21b** *43/00*
**U.S. Cl. 166—313** **13 Claims**

A system and apparatus for circulating well fluids in a well having a U-tube flow path therein, wherein the well fluids are utilized to pump loading fluids or dead or gas-free fluids into the well to kill the same, or to circulate well tools in the flow conduit by the pump-down through the flow line method without wasting the circulating fluids, or to displace the circulating fluids from the well, and to load the well with a load-



ing fluid to perform other operations thereon. The well fluids may be used as a source of power for operating the pump of a system, and a hydraulic fluid pump may be utilized, or pressure from another source may be utilized, for operating the pump to circulate the fluids in accordance with the invention.

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## 3,654,996
## CEILING CONSTRUCTION

**Michael Naglowsky, 709 Walnut Street, Erie, Pa.**

**Filed Sept. 12, 1969, Ser. No. 857,370**
**Int. Cl. A62c** *35/10*
**U.S. Cl. 169—2** **1 Claim**

A ceiling panel and a ceiling constructed of such panels. The panels are made of a powder or finely divided fiber like material supported on a material which will be melted by heat. When the sheet of support material is melted away, the powder will fall and put out the fire without damage to adjacent materials, which is inherent in water fire fighting.

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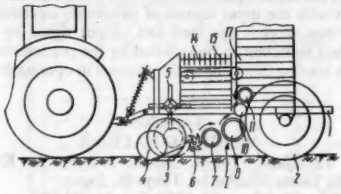
## 3,654,997
## ROOT HARVESTER

**Andrei Ivanovich Partyanko, ulitsa Zhikhorskaya, 49, kv. 2, Kharkov; Valentin Andreevich Lastovenko, ulitsa Lermontovskaya, II, kv. 3, Kharkov; Viktor Vasilievich Dudka, prospekt Gargarina, 201, Kharkov; Fedor Leontievich Rodenko, poselok Zhikhor, pereulok Tsiolkovskogo 4, Kharkov; Grigory Ivanovich Onischenko, ulitsa Karavaeva, 15, kv. 17, Dnepropetrovsk; Adolf Senenovich Vatkin, prospekt Karla Marxa, 81, kv. 3, Dnepropetrovsk; Alexri Alexandrovich Pokusa, ulitsa Artema, 28, kv. 36, Dnepropetrovsk, and Ivan Mikhailovich Ruzin, ulitsa Fabrika, 27, Dnepropetrovsk, all of U.S.S.R.**

**Filed Nov. 4, 1970, Ser. No. 86,889**
**Int. Cl. A01d** *17/06*
**U.S. Cl. 171—58** **4 Claims**

A root harvester having separating tools located directly

following dig-out tools and consisting of two rows installed one above the other, the separating tools of the first row



being in the form of two pairs of coaxial rotating auger screws, each pair being threaded in different directions.

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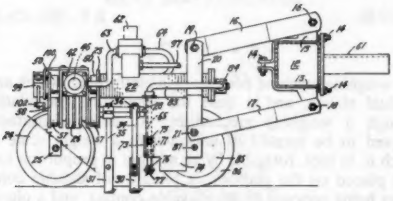
**3,654,998**
**PHOTO-ELECTRIC PLANT THINNERS**

**Benjamin A. Shader, Denver, Colo., assignor to The Eversman Mfg. Company, Denver, Colo.**

**Continuation-in-part of application Ser. No. 673,598, Oct. 9, 1967, now Patent No. 3,512,587. This application Feb. 18, 1970, Ser. No. 12,288**
**Int. Cl. A01b** *63/00, 33/00*
**U.S. Cl. 172—6** **9 Claims**



This application employs a plurality of photo-electric pneumatically actuated, plant-row-thinning assembly, there being a plurality of said assemblies in side-by-side relation on a transverse tool bar, each assembly haVing a pair of similar, axially spaced, integrally connected, pendulously suspended, relatively narrow, arcuate, photo-electrically actuated, root-cutting knives positioned upon opposite sides of a plant row which simultaneously and reciprocally swing laterally of the row so that when one knife exits from the row the other knife will simultaneously enter the row forwardly of the point of exit of the first knife to leave standing seedlings between the successive axial root-cutting paths of said knives. The knives of each thinning assembly are suspended from an axially extending knife shaft which is reciprocally rotated by means of an actuating lever extending upwardly from the knife shaft and terminating between a pair of horizontally aligned pneumatic pistons which are alternately pressurized to actuate the lever back and forth so as to reciprocate the pair of knives laterally of the row.

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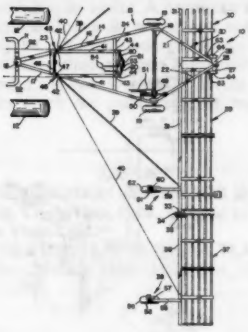
**3,654,999**
**IMPLEMENT CARRIER**

**Raymond C. Fischer, Hinsdale, Ill., assignor to International Harvester Company, Chicago, Ill.**

**Filed Jan. 19, 1970, Ser. No. 3,702**
**Int. Cl. A01b** *65/02;* **B60d** *1/18*
**U.S. Cl. 172—311** **2 Claims**

A relatively wide, winged field implement has transversely aligned tool-carrying wing sections hinged together on a vertical axis so that the wings can be swung to a longitudinally extending position behind the propelling tractor to facilitate transport, particularly over roads and through gates and the like, draft transmitting members extending from the outer



ends of the wings to the main implement frame being connected to the main frame by latch means which can be controlled by the operator from his station on the tractor.

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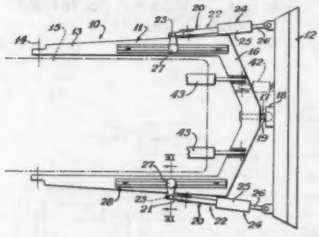
**3,655,000**
**POWER PITCHING BULLGRADER**

**Bernard L. Winkler, Chicago, Ill., assignor to International Harvester Company, Chicago, Ill.**

**Filed Jan. 12, 1970, Ser. No. 2,207**
**Int. Cl. E02f** *3/76*
**U.S. Cl. 172—804** **3 Claims**



Power-adjusted bulldozing attachment for a tractor having a C-frame and a bullgrading blade capable of pitching, tilting, and angling. A mid-region of the blade has a universal mounting on the base of the C-frame. Pairs of strut member incorporating power units are connected to the ends of the blade and the legs of the C-frame for pitching and tilting the blade. The blade is angled by shifting the struts along tracks on the legs of the C-frame. The struts are fixed at various locations on the frame by the use of lock pieces on the struts and spaced slots in the tracks receiving the lock pieces.

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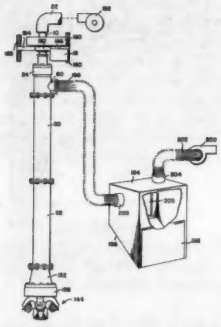
**3,655,001**
**LARGE DIAMETER EARTH DRILL**

**Bernard A. Hoffman, West Chester, Pa., assignor to Schramm, Inc., West Chester, Pa.**

**Filed Feb. 4, 1970, Ser. No. 8,664**
**Int. Cl. E21b** *21/00*
**U.S. Cl. 175—213** **16 Claims**

A system for producing large-diameter, air-drilled holes through rock comprises a hollow, rotatable drill stem having a large bit at its lower end, and surrounded by a pipe which is relatively narrow compared to the hole diameter, which forms between itself and the drill stem, an annular passage.

Air is blown downwardly through the drill stem, emerges at an opening at the location of the bit, and carries cuttings through the annular passage to the surface. A vacuum is drawn in a dust diverter immediately above the bit to insure



that the cuttings enter the annular passage. Air descending through the drill stem under pressure operates a piston which imparts a hammering action to the bit. Drill stem sections and outer pipe sections may be added as required.

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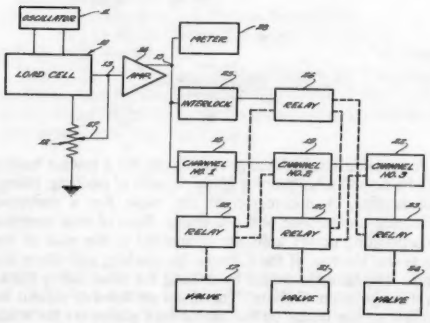
**3,655,002**

## ELECTRONIC WEIGHING SYSTEM FOR BATCHING OPERATIONS

**William H. Jones, Villar Park, and Martin W. Hamilton, Arlington Heights, both of Ill., assignors to The Dole Valve Company, Morton Grove, Ill.**

**Filed Sept. 20, 1968, Ser. No. 761,087**
**Int. Cl. G01g** *19/22*
**U.S. Cl. 177—70** **12 Claims**




An electronic weighing system for batching operations which includes a load cell for weighing a principal container which receives a number of ingredients from individual ingredient sources. The load cell generates an output signal in proportion to the instantaneous weight received in the container, and this signal is utilized to turn "off" one ingredient channel and to actuate a second channel. The output from the load cell is compared with an input signal associated with each channel which determines the loading which is to be added to the container from each ingredient channel. The input load signal for each channel is derived respectively from a number of potentiometers which are coupled in series in such a way as to provide the correct input comparison signal to produce the proper load output for each ingredient channel. This is accomplished by successively switching into series arrangement each new channel after the loading requirements of the previous channel have been satisfied. In this way, the input signal established at each channel in combination with the input signals of previously operated channels always exceeds the load cell output signal by a magnitude just sufficient to be satisfied by the predetermined ingredient loading demands of the channel in operation.

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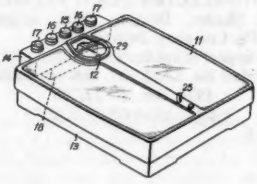
**3,655,003**

## WEIGHING MACHINE

**Kaneo Yamajima, Tokyo, Japan, assignor to Kabushiki Kaisha Tanita Seisakusho, Tokyo-to, Japan**

**Filed Sept. 23, 1970, Ser. No. 74,684**
**Int. Cl. G01g** *23/30, 19/413*
**U.S. Cl. 177—173** **9 Claims**



A weighing machine comprising a platform on which an individual stands, and a base for supporting the platform through a weighing mechanism. A movable contact is adapted to be rotated in unison with a weight scale disc which is, in turn, rotatable by an amount in proportion to the load placed on the platform, a plurality of slidable contact plates being opposed to the movable contact, and a plurality of lamps being adapted to be separately lit as the contact is rotated through engagement with the slidable contact plates. And an adjustable height scale ring is arranged in concentric relation with the weight scale disc peripherally bearing a height scale and carrying the slidable contact plates, with which a weighted person may recognize at a glance the interrelation between an actual weight of the weighed person and the optimum weight relative to a particular height of the weighed person according to a lit lamp and the lamp corresponding to the optimum weight through operation of manually coordinating the height scale ring to the weight of the weighed person.

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**3,655,004**

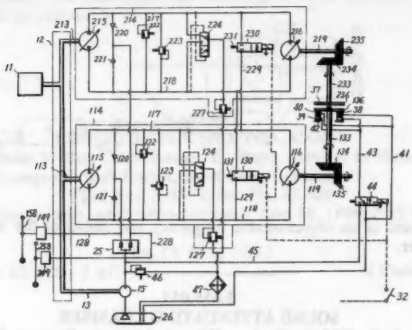
## HYDRAULICALLY DRIVEN VEHICLE

**Kenzo Hoashi, Tokyo, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho (Komatsu, Ltd.), Tokyo, Japan**

**Filed Feb. 16, 1970, Ser. No. 11,404**
**Claims priority, application Japan, Mar. 27, 1969, 44/22717**
**Int. Cl. B62d** *11/04*
**U.S. Cl. 180—6.48** **3 Claims**

The hydraulically driven vehicle of the wheeled vehicle type or the crawler vehicle type, provided with a short-circuit line between a pair of main passages for the liquid medium for communicating them with each other only during the operating lever is in neutral position, a braking system operable for the same period with the above, a tracting starting system which generates a difference in pressure between the pair of main passages when the hydraulic motor is reversely driven, and, in case of the crawler vehicle type, a pair of short lines connecting the higher pressured sides of said pair

of main passages with each other and the lower pressured sides thereof with each other, respectively, and a friction



clutch associating the two output shafts with each other, only during the two operating levers are in parallel.

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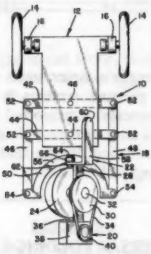
**3,655,005**

**SPHERICAL DRIVE VEHICLE**

**Enrique J. Chicurel, Av. Mexico 27-4, Col. Hipodromo, Mexico City 11, Mexico**

**Filed Sept. 26, 1969, Ser. No. 861,427**
**Int. Cl. B62d** *57/00, 61/06*
**U.S. Cl. 180—7 R** **10 Claims**



A multi-wheel vehicle is provided with a single control lever for changing the speed and direction and movement of the vehicle. The lever controls the angular relationship of a hemispherical drive wheel with respect to the vehicle support surface for steering and providing an infinite number of stepless forward and reverse speeds.

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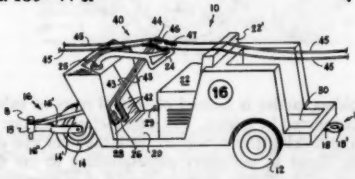
**3,655,006**

**REMOTE CONTROL APPARATUS FOR MOTORIZED VEHICLES**

**Wilbur P. Cooke, 218 Sunset Street, Spartanburg, S.C.**

**Filed Aug. 8, 1969, Ser. No. 848,452**
**Int. Cl. B60k** *33/00*
**U.S. Cl. 180—77 R** **4 Claims**



Apparatus and method for remotely controlling the accelerator and/or the brakes of motorized vehicles that are connected in tandem with one or more additional motorized vehicles. A pedal engaging member having holding brackets incorporated thereon telescopes over the accelerator or brake pedal and extends upwardly and rearwardly from the pedal terminating at an eyelet. A connector is affixed to the eyelet and extends forwardly to the next vehicle in tandem where it may be adjustably and removably affixed to the eyelet of another control member. A forward pulling motion on the connector will thus accelerate or brake all the vehicles in tandem to which the pedal engaging members are attached.

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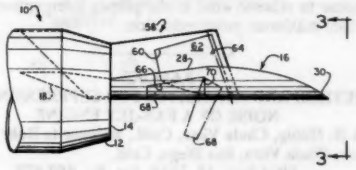
**3,655,007**

**SOUND SUPPRESSION SYSTEM FOR JET ENGINE**

**Jack H. Hilbig, Chula Vista, Calif., assignor to Rohr Corporation, Chula Vista, Calif.**

**Filed Sept. 11, 1970, Ser. No. 71,446**
**Int. Cl. B64d** *33/06;* **F01n** *1/14, 1/16*
**U.S. Cl. 181—33 E** **17 Claims**



System is intended for use with a jet engine and comprises an elongate suppressor panel which is connected to the aft end of the nozzle and extends rearward. The panel is generally rectilinear in longitudinal section and concavo-convex in transverse cross section with its concave face directed upward. The panel is generally centered in the jet stream to divide it into upper and lower portions of generally equal volume. The panel serves as a shield against downward radiation of sound waves from the upper portion of the stream and reflects them upward in a converging pattern. The convex lower face of the panel reflects the sound waves from the lower portion of the stream downward but at the same time disperses them laterally so that the unit sound intensity at the ground is substantially reduced. The noise level at the suppressor is initially substantially reduced by making the panel of a very efficient sound absorbing material such as a honeycomb core with a porous skin. The system also includes a thrust reverser. A support panel extends upward from the suppressor panel and carries a pair of blocker doors which swing laterally to block aft flow of the upper portion of the jet stream, and a single blocker door is mounted in the suppressor panel and swings downward to block aft flow of the lower portion of the jet stream. The reversing forces above and below the nozzle axis balance out the directional moments and avoid instability.

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**3,655,008**

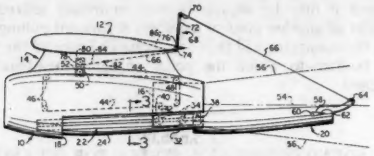
**SOUND SUPPRESSING APPARATUS**

**Victor Millman, San Diego, Calif., assignor to Rohr Corporation, Chula Vista, Calif.**

**Filed Jan. 28, 1971, Ser. No. 110,460**
**Int. Cl. B64c** *9/38;* **F01n** *1/14;* **B64d** *33/06*
**U.S. Cl. 181—33 E** **12 Claims**

Elongate noise reflecting and suppressing shield of upwardly concave cross section is carried by engine housing in generally horizontal attitude. Forward end of shield has pivotal mounting means on transverse axis which move fore and aft on tracks carried by housing. Aft end of shield is maintained against downward swinging by cables attached to its aft end and trained over pulleys on free end of mast pivotally mounted on wing over nozzle exit. Forward ends of cables are connected to servo motor. Mast is swingable down

flush with wing for cruise flight and deployed to upright position for takeoff and low level flight. When drive means moves pivotal mounting means aft to deploy shield to position beneath and intercepting jet stream. the servo motor



pays out cables at proper rate to maintain attitude of shield substantially constant. When shield is fully deployed, aerodynamic reaction means on aft end of shield raise it in response to relative wind to the proper interception angle to produce maximum noise reduction.

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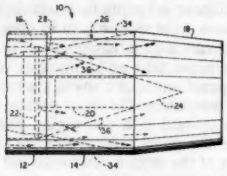
**3,655,009**

**METHOD AND APPARATUS FOR SUPPRESSING THE NOISE OF A FAN-JET ENGINE**

**Jack H. Hilbig, Chula Vista, Calif., assignor to Rohr Corporation, Chula Vista, San Diego, Calif.**

**Filed Sept. 18, 1969, Ser. No. 859,070**
**Int. Cl. B64d *33/06*; F01n *1/14***
**U.S. Cl. 181—33 HC** **2 Claims**



A tubular housing is disposed in spaced relation around the casing of a fan-jet engine and extends rearwardly therefrom. A convoluted ring is joined at its circular forward edge to the aft edge of the engine casing and is formed with lobes which extend axially thereof and increase in radial dimension in the downstream direction, so that the aft ends of the lobes project both radially inwardly from said engine casing and radially outwardly to the wall of said housing at the aft end of the latter. The forward edge of a nozzle is joined to the aft edge of the housing, and fan air of the engine flows through the space between the engine casing and the housing, through the spaces between the lobes, and into the nozzle. Exhaust gas of the engine flows from the engine into the passages bounded by the inner surfaces of the lobes and thence into the nozzle.

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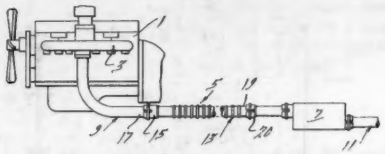
**3,655,010**

**ACOUSTIC CONDUIT WITH WRINKLE SECTION**

**Bert DuBois, Lake Columbia, Brooklyn, Mich., assignor to Tenneco Inc., Racine, Wis.**

**Filed July 17, 1970, Ser. No. 55,689**
**Int. Cl. F01n *1/02*, *1/08***
**U.S. Cl. 181—36 B** **3 Claims**

A conduit having an outwardly extending wrinkled wall of approximately a 4 foot length is used in a motor vehicle exhaust system to provide acoustic control and attenuation, the pipe section preferably being located to include an anti-node



point of an objectionable frequency and ahead of the muffler.

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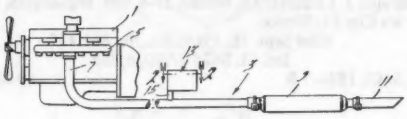
**3,655,011**

**SOUND ATTENUATING CHAMBER**

**Earl G. Willett, Racine, Wis., assignor to Tenneco Inc., Racine, Wis.**

**Filed June 10, 1970, Ser. No. 45,041**
**Int. Cl. F01n *1/02***
**U.S. Cl. 181—48** **2 Claims**



A short overall length quarter wave or Quincke tuner for use in automotive exhaust systems to attenuate predetermined sound frequencies is provided by a folded or box structure or a helical structure providing a zig-zag sound path with an effective acoustical length that is materially greater than the physical length of the tuner.

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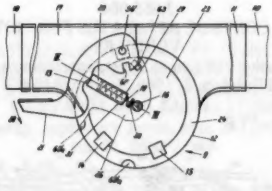
**3,655,012**

**UNIVERSAL FOLDING LADDER**

**Helmut Hoffman, and Walter Hoffman, both of Talstrasse 11, Burgstall (Murr), Germany**

**Filed July 30, 1970, Ser. No. 59,505**
**Claims priority, application Germany, July 30, 1969, P 19 38 696.0; Feb. 14, 1970, P 20 06 846.6**
**Int. Cl. E06c *1/383***
**U.S. Cl. 182—163** **10 Claims**



A folding ladder is formed of several pairs of ladder sections connected by a joint. The joint includes on one section a circular locking disc concentric with the joint axis and with recesses about its periphery corresponding to the different positions of the ladder sections, and a stop member on the other section engageable in the recesses. A releasing lever is provided which lift the locking member out of the recesses. An arresting device associated with the releasing lever locks

the releasing lever in its releasing position during movement of the ladder sections with respect to each other in one direction and disengages the releasing lever at the end of such movement.

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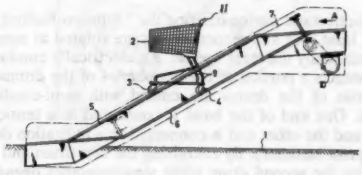
3,655,013

## CONVEYOR FOR SHOPPING CARTS

Wilhelm Weller, Linderhausen, Germany, assignor to Messrs. Transporttechnik GmbH, Gevelsberg, Germany

Filed Apr. 3, 1970, Ser. No. 25,508
Claims priority, application Germany, Apr. 18, 1969, P 19 19 740.1
Int. Cl. B65g *17/22*
U.S. Cl. 186—1 AC 8 Claims



In a multifloor department store, floor-to-floor conveying means for customer carts comprising a pair of moving belts disposed laterally of the cart conveying path, grippers being carried by the belts to automatically engage the carts.

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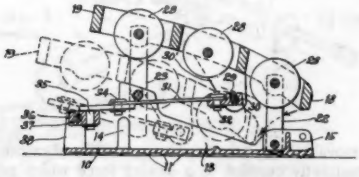
3,655,014

## AIRCRAFT WHEEL CHOCKS

Ralph Andrew Nyborg, 641 North Main Street, Naperville, Ill.

Filed Mar. 16, 1970, Ser. No. 19,721
Int. Cl. B60t *3/00*
U.S. Cl. 188—32 6 Claims



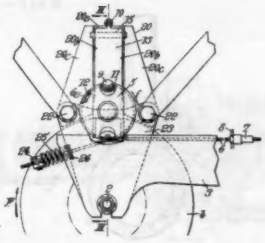
The wheel chock of this invention provides a shoe movably supported on a base from which it may be elevated for chocking contact with an aircraft wheel, and when it is retracted the entire body of the shoe moves away from the periphery of the wheel and simultaneously away from the area of tire contact with the ground, and meanwhile the base remains stationary.

3,655,015

## DISC BRAKES CONTROLLED BY BOWDEN CABLES

Bernard Rene Mennesson, Neuilly sur Seine, France, assignor to Societe D'Appareils De Controle Et D'Equipement Des Moleurs S.A.C.E.M.

Filed Sept. 25, 1969, Ser. No. 861,060
Claims priority, application France, Sept. 30, 1968, 168137
Int. Cl. F16d *65/38*
U.S. Cl. 188—71.7 10 Claims



A disc brake for a cycle is actuated by a drum around which a control cable is wrapped. The cable is anchored to the drum by releasable clamping means.

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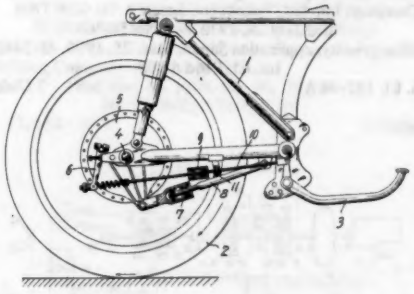
3,655,016

## ANTI-SKID BRAKE APPARATUS

Yoshinori Watanabe, Saitama-ken, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Chuo-ku, Tokyo, Japan

Filed June 5, 1970, Ser. No. 43,808
Claims priority, application Japan, June 5, 1969, 44/43556
Int. Cl. B60t *8/00*
U.S. Cl. 188—181 T 10 Claims



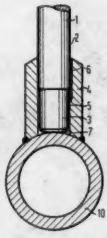
An anti-skid brake apparatus comprises a brake plate rotatably attached to a vehicle frame with a first spring interposed between the plate and the vehicle body. A brake actuator member on the brake plate is connected via a second spring to a brake pedal, and the two springs are so arranged that they resist the rotation of the brake plate imposed thereon by the wheel at the time of brake operation.

3,655,017

## SHOCK ABSORBER ASSEMBLY AND METHOD OF MAKING THE SAME

Harry Lorcher, Dittelbrunn, and Franz Spreitzer, Schweinfurt am Main, both of Germany, assignors to Fichtel & Sachs AG, Schweinfurt am Main, Germany

Filed May 11, 1970, Ser. No. 35,949
Claims priority, application Germany, May 14, 1969, P 19 24 540.0
Int. Cl. F16f 9/54
U.S. Cl. 188—321 6 Claims



A partly chromium plated piston rod of a telescopic shock absorber is assembled with a mounting ring by insertion of the unplated axially terminal rod portion and of an adjacent plated portion into a bore of a sleeve on the mounting ring, the chromium plate conformingly engaging the sleeve face in the bore with a press fit, and the unplated rod portion and the sleeve face bounding an annular gap filled with hard solder. When the plated rod portion in the bore has a length at least equal to the rod diameter, and the unplated portion a length of at least 1.25 times the diameter, transverse bending stresses on the assembly are not significantly concentrated in vulnerable portions of the rod, and the rod is held in the sleeve with great strength.

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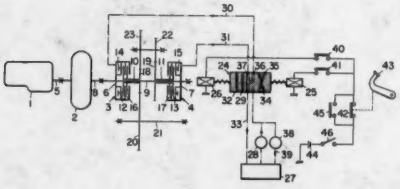
3,655,018

## CLUTCH CONTROL SYSTEM FOR MOTOR VEHICLES

Shunichiro Higuchi, and Kazunobu Katayose, both of Yokohama, Japan, assignors to Okamura Manufacturing Company, Limited, Yokohama, Japan

Filed July 20, 1970, Ser. No. 56,464
Claims priority, application Japan, Mar. 25, 1970, 45/24429
Int. Cl. F16d 67/02
U.S. Cl. 192—4 A 7 Claims



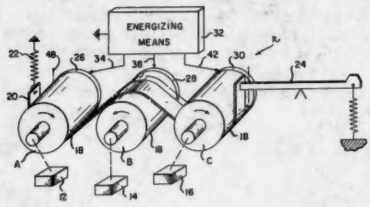
A clutch control system for motor vehicles which enables the driver to switch the operation of a clutch for forward drive over to a clutch for reverse drive and vice versa in a simple manner, and which permits automatic disengagement of either clutch when the brakes are applied with the particular clutch engaged.

3,655,019

## ELECTROSTATIC DEVICE WITH CONTROLLABLE ACCELERATION

Theodore T. Trzaska, Dayton, Ohio, assignor to The National Cash Register Company

Filed Nov. 23, 1970, Ser. No. 91,956
Int. Cl. F16d 13/10, 27/12
U.S. Cl. 192—48.9 5 Claims




An electrostatic device utilizing the "Johnson-Rahbek" effect. At least first and second drums are rotated at constant but substantially different speeds. An electrically conductive band contacts a portion of the peripheries of the drums; the peripheries of the drums are coated with semi-conductor material. One end of the band is connected to a tensioning device, and the other end is connected to a utilization device (like a print hammer). By energizing the first drum and then energizing the second drum while simultaneously deenergizing the first drum, a controlled acceleration of the band is obtained. Several drums and several bands (to operate several utilization devices) may be used. Selective energization of the bands to be driven is obtainable.

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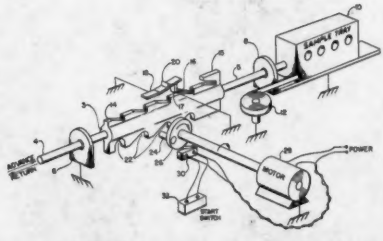
3,655,020

## MECHANICAL POSITIONING DEVICE FOR PRECISELY DETERMINING A SERIES OF MECHANICAL LOCATIONS

Nico J. Van Slooten, Chino, Calif., assignor to Beckman Instruments, Inc.

Filed Dec. 10, 1970, Ser. No. 96,830
Int. Cl. F16d 71/00; F16h 27/04
U.S. Cl. 192—142 R 9 Claims




A movable body member having a series of ratchet teeth is intermittently coupled to a driving force which moves the body member. A ratchet arm is precisely mounted adjacent the series of ratchet teeth to engage the series of teeth when the body member is decoupled from the driving force. A restoring force is applied to the body member to press the ratchet arm firmly against each ratchet tooth with which it comes in contact, thereby precisely locating the body member in a series of mechanical positions. A ratchet spring forces the ratchet arm to engage each tooth of the series of ratchet teeth as each tooth moves adjacent to the arm. A device is provided for restraining the ratchet arm from en-

gaging the ratchet teeth after the last tooth in the series of ratchet teeth is passed. The ratchet arm is restrained until the body member is returned by the restoring force to an initial position where the ratchet arm is released from the restraint and engaged with the ratchet teeth whereby the series of mechanical movements may be repeated.

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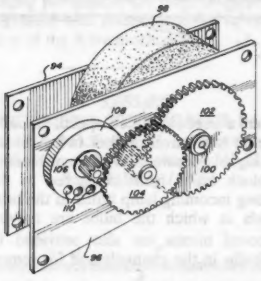
**3,655,021**
**IMBALANCED BRAKING DEVICE**

Nicholas J. Froio, Harvey, Ill., assignor to Froio Corporation, Harvey, Ill.

Filed Nov. 23, 1970, Ser. No. 91,934
Int. Cl. B60t *8/04*; B65g *13/00, 13/075*
U.S. Cl. 193—35 A 15 Claims



This braking device for retarding moving objects such as a pallet on a gravitationally-actuated conveyor system comprises a housing and a gear train or equivalent supported by the housing, including at least a first gear and a terminal gear and preferably an intermediate gear intermeshed so as to progressively increase angular velocity as the first gear is rotated. At least the terminal gear in the gear train is substantially imbalanced about the rotational axis thereof whereby rotational resistance increases as angular velocity increases. Means are also provided for translating the movement of the moving objects into rotational movement of the first gear so that the forces to rotate the gear train, including the imbalanced last gear, act to retard the moving object. In specific embodiments, the imbalance of the last gear is obtained by selectively removing material from a portion thereof, by selectively adding weight thereto or a combination of both.

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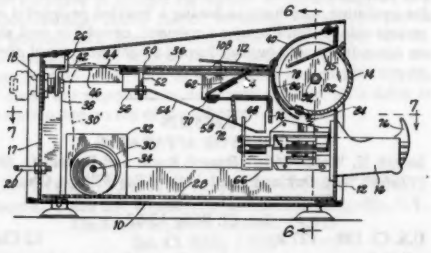
**3,655,022**
**STAMP VENDING MACHINE HAVING KNIFE TO SEPARATE STAMPS**

Hubert M. Giepen, 6939 South Benneth Avenue, Chicago, Ill.

Filed May 18, 1970, Ser. No. 38,140
Int. Cl. G07f *11/68*
U.S. Cl. 194—2 13 Claims



A stamp dispensing device including a stamp guide member, means to supply a continuous roll of stamps to said guide member, a stamp transporter assembly including a moveable brush member adapted to engage the perforations between individual stamps in the roll to advance the stamps through the guide member and knife means for cutting the stamps advanced through the guide member.

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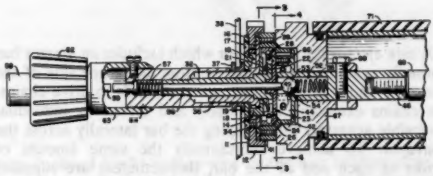
**3,655,023**
**SELECTIVE POSITIONING MECHANISMS FOR PLATENS OR THE LIKE**

Anthony Stanevich, Streamwood, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed July 11, 1969, Ser. No. 840,949
Int. Cl. B41j *19/76*
U.S. Cl. 197—114 R 16 Claims



A platen rotating assembly for a teletypewriter having positive line-feed permits the platen to be manually rotated either incrementally or freely. A line-feed spur gear is connected to the platen through first and second normally engaged clutches to rotate the platen whenever the spur gear is rotated. When the spur gear is not rotated (1) the platen may be indexed in predetermined increments by manual rotation of a knob operatively connected to the platen and a first clutch controller which selectively permits incremental disengagement of the first clutch through the second clutch while the second clutch remains engaged, or (2) the platen may be freely rotated by (a) manual actuation of a second clutch controller which selectively disengages the second clutch to bypass the first clutch and (b) simultaneous manual rotation of the knob directly to rotate the platen.

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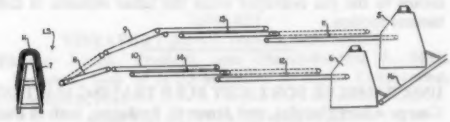
**3,655,024**
**METHOD OF AND APPARATUS FOR FEEDING WORKPIECES TO TWO MACHINE UNITS**

Arthur H. Horn, Waukesha, Wis., assignor to Chas. H. Stehling Company, Milwaukee, Wis.

Filed May 22, 1970, Ser. No. 39,810
Int. Cl. B65g *37/00, 47/26*
U.S. Cl. 198—20 T 9 Claims



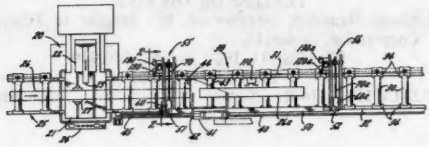
A belt-type conveyor apparatus for feeding workpieces to two separate machine units arranged in tandem and operating at the same speed, by which workpieces loaded onto the receiving end of the conveyor apparatus at a rate twice the operating speed of the machine units, are fed to the machine units at a rate that matches the speed of the machine units.

3,655,025

## SIDE EJECTOR FOR BAND SAW CONVEYOR OR THE LIKE

John P. Wilkin, Schaumburg, Ill., assignor to Armstrong-Blum Manufacturing Company, Chicago, Ill.

Filed June 29, 1970, Ser. No. 50,706
Int. Cl. F01k 23/00; B65g 47/00
U.S. Cl. 198—24 3 Claims



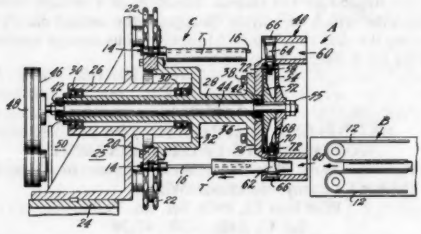
A side ejector for a conveyor which includes an ejector bar normally extending in storage position along one side of the conveyor and which is connected at its ends to drive chains, the chains extending transversely and driven by individual reversible actuators for sweeping the bar laterally across the conveyor. To achieve substantially the same amount of stroke at each end of the bar, the actuators are supplied through a flow divider. Each actuator has a diverter valve for diverting pressure fluid into the sump upon completion of its stroke thereby to insure that the actuators remain precisely in step with one another free of any cumulative error.

3,655,026

## POSITIVE FEED TRANSFER FOR PIN CONVEYOR

Hans Hirn, Iselin, N.J., assignor to American Can Company, Greenwich, Conn.

Filed Aug. 17, 1970, Ser. No. 64,180
Int. Cl. B65g 47/00
U.S. Cl. 198—25 16 Claims



A method of and apparatus for transferring flexible tubular articles, such as elongated collapsible tube bodies, from a longitudinal feeding means onto an endless pin conveyor disposed at right angles thereto wherein the articles are positively gripped and transferred from the longitudinal feeding means to the pin conveyor while the latter remains in continuous motion.

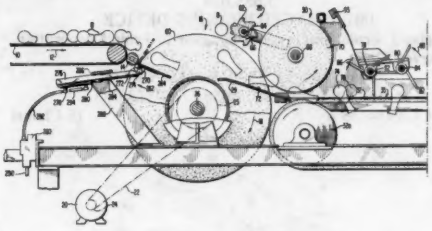
3,655,027

## UNSCRAMBLER FOR LIGHT BULB TRAYING MACHINE

George Albert Douglas, and James C. Prokopec, both of Danville, Ky., assignors to Corning Glass Works, Corning, N.Y.

Filed Apr. 15, 1970, Ser. No. 28,831
Int. Cl. B65g 29/00
U.S. Cl. 198—33 AA 9 Claims

A photoelectric bridge containing a plurality of photoelectric elements is placed across a plurality of channels formed between adjacent conveyor belts and carrying light bulbs which are to be loaded into apertures in a tray. There must be a light bulb in each channel at the loading end so that each aperture in the tray is filled. The photoelectric bridge detects the speed of the light bulbs in each channel and produces an electric signal whenever the light bulbs are moving at less than a predetermined speed, thereby indicating that that channel is relatively full of bulbs. Upstream of the conveyor, the signal operates a diverter or blocking means to temporarily block bulbs from being fed to that channel, thereby diverting incoming lamp bulbs to the other relatively empty channels in which the bulbs are moving relatively quickly. Improved means are also provided for properly orienting the bulbs in the channels and for removing broken bulbs.

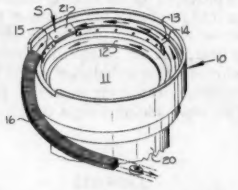


3,655,028

## VIBRATORY BOWL FOR FEEDING BUTTONS

Howard A. Hodgins, Newark, Del., assignor to Enterprise Machine and Development Corp., New Castle County, Del.

Filed Sept. 17, 1970, Ser. No. 73,147
Int. Cl. B65g 47/24; B65d 83/00
U.S. Cl. 198—33 AA 4 Claims



A button selecting section is provided in the discharge end portion of the upwardly spiraled conveyor track of the bowl for returning improperly orientated buttons back into the bowl and for permitting continued movement of properly orientated buttons to the discharge end of the feeder. The selector section is easily replaceable so that buttons of various sizes may be selected and the selector section is adapted for operation with buttons having a beveled peripheral edge on one side, buttons having a rounded, convex or oval shape on one side, or with buttons having a concave central portion on one side.

3,655,029

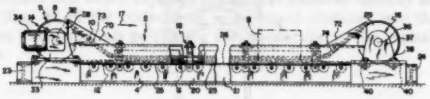
## CONVEYOR APPARATUS

Joseph H. Webb, 26957 Russell Road, and Donald G. Stiles, 29682 West Oakland Road, both of Bay Village, Ohio

Filed May 5, 1969, Ser. No. 821,884
Int. Cl. B65g 13/02
U.S. Cl. 198—127 R 13 Claims

A conveyor apparatus including a frame and a row of spaced, rotatable members mounted on the frame. A drive

mechanism including a flexible, endless drive element mounted on the frame for driving the rotatable members. The drive element includes a plurality of alternately spaced protuberance-like actuating portions disposed for coacting driving engagement with selective of the rotatable members,



and at least one abutment mechanism including a lengthwise extending abutment member mounted on the frame for urging the actuating portions of the drive element into pressure driving engagement with selective of the rotatable members upon actuation of the drive mechanism.

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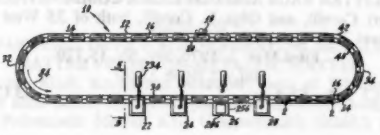
**3,655,030**
**SYSTEM FOR SORTING MAIL BAGS**
**Ernest B. Hardwig, P.O. Box 2685, Jacksonville, Fla.**
**Filed June 19, 1970, Ser. No. 47,812**
**Int. Cl. B65g** *15/00*
**U.S. Cl. 198—135** **7 Claims**



A sorting apparatus comprising a train of carriers each having a tiltable support provided with a gripper device for releasably retaining an empty mail sack on the carrier. The carriers follow a loop track and are advanced therealong to and past a loading station and a plurality of unloading stations. Each carrier includes a coding device which may be set by an operator at the loading station at the time an empty sack is positioned in the gripper device. A cyclic drive is provided which includes an endless chain carrying a pawl in a path which approaches the track to engage the pawl with a carrier and move the train a predetermined distance, which is an even multiple or submultiple of the distances between loading and unloading stations, and then departs therefrom to disengage the pawl. As a carrier reaches the loading station, it trips an indexing device which stops that carrier and, accordingly, the train, in proper position. The pawl in departing from the carrier contacts the indexing device and returns it to retracted cocked condition removing the stop element from the path of the carrier, whereby the train may again be moved upon engagement of the pawl with the next carrier. Code sensing arrangements are located at the unloading stations operative to actuate mechanism to tilt the support of a correspondingly coded carrier. In tilting, the support moves the gripped sack laterally, and releases the gripper device. Mechanism at the station is also actuated to restrain the lower portion of the sack against lateral movement whereby the sacks are deposited in horizontal position on a table at the station one on top of the other to form a stack.

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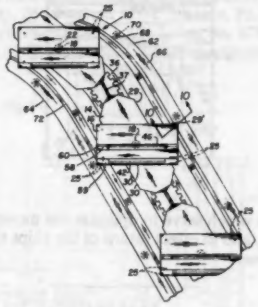
**3,655,031**
**CONVEYOR APPARATUS FOR INDIVIDUAL SUPPORTS**
**Robert L. Cahn, 257 Grand Central Avenue, Amityville, N.Y.**
**Filed July 16, 1970, Ser. No. 55,525**
**Int. Cl. B65g** *17/16*
**U.S. Cl. 198—138** **7 Claims**

Conveying apparatus includes a plurality of holders arranged to carry supports or trays in a horizontal position. The holders are moved in horizontal paths in upper and lower levels and in inclined paths between levels while the trays are maintained in horizontal positions at all points. Each holder is comprised of two pivotally engaged plates. One plate is connected to a conveyor track while the other plate holds the



tray. Inclined tracks engage pins on the tray holding plate to keep the tray horizontal while the conveyor track plate turns angularly with respect to the tray holding plate. The tray holding plate has spring biased bars arranged to engage trays as they are automatically fed on to the tray holders one at a time.

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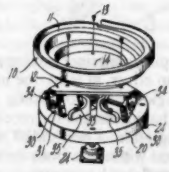
**3,655,032**
**VIBRATORY FEEDER**
**Grant N. Willis, Bristol, Conn., assignor to The Arthur G. Russell Company, Incorporated, Bristol, Conn.**
**Filed May 26, 1970, Ser. No. 40,678**
**Int. Cl. B65g** *27/32*
**U.S. Cl. 198—220 BC** **20 Claims**



A vibratory feeder of the bowl type in which the support system for the bowl includes a torsion bar extending vertically upwardly from a base and attached to the underside of the bowl at its axis. The torsion bar may be formed with two integral arms extending parallel to the main bar and provided with a vertically adjustable clamp for varying the stiffness of the torsion bar for tuning purposes.

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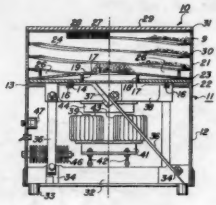
**3,655,033**
**VIBRATORY BOWL-TONER DISPENSER**
**Thomas Lynch, Penfield, and Dineshchandra S. Shah, Syracuse, both of N.Y., assignors to Xerox Corporation, Rochester, N.Y.**
**Filed May 27, 1970, Ser. No. 40,839**
**Int. Cl. B65g** *27/02*
**U.S. Cl. 198—220 BC** **6 Claims**

Toner feed mechanism for use in xerographic reproduction apparatus. The mechanism is characterized by the provision of a container and a structure for vibrating the container so that the toner is moved up an internally disposed, spiral ramp, toward an outlet where the toner phases from the con-

tainer to a vertically disposed conduit communicating therewith. A screen is provided at the transition between the container and the conduit to prevent passage of irregularly



shaped chips which serve to optimize the movement of toner to the outlet, and to effect return of the chips to a sump area in the container.

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**3,655,034**

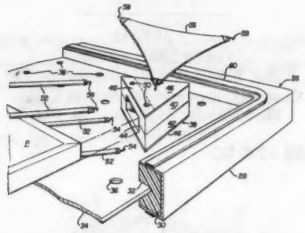
**SHIPPING CONTAINER**

**Irving Stollman, Oak Park, and Raymond Banaitis, Detroit, both of Mich., assignors to Polycon Industries, Inc., River Rouge, Mich.**

**Filed Feb. 24, 1970, Ser. No. 13,435**

**Int. Cl. B43k** *31/00*

**U.S. Cl. 206—1 R** **2 Claims**



A protective shipping container having a substantially rigid energy absorbing top cover, at least one intermediate section which includes a rigid frame containing a shock absorbing body member, and having means for receiving the edges of a perforated mounting plate, a perforated mounting plate having its edges confined within the body member, a plurality of corner suspension and shock mounts situated on at least one of the surfaces of the plate and fixed in place, each mount having a recess therein adapted for receiving a corner of a picture frame or other art object, and a substantially rigid energy absorbing bottom cover. Means are provided for preventing moisture from entering the container when the top cover, intermediate section and bottom cover are fastened together, and means are also provided for fastening the top cover, intermediate section, and bottom cover together.

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**3,655,035**

**MULTIPLEX CAPSULE FOR DENTAL FILLING MATERIALS**

**Ernst A. Muhlbauer, Hamburg, Germany, assignor to Zahn-Porzell an KG E. Muhlbauer & Co., Hamburg, Germany**

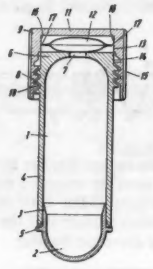
**Filed Oct. 29, 1969, Ser. No. 872,152**

**Claims priority, application Germany, Mar. 13, 1969, P 15 66 294.9**

**Int. Cl. B65d** *25/08, 81/32*

**U.S. Cl. 206—47 A** **1 Claim**

A capsular container for storing separate components which are mixed together prior to use in the field of dentistry having a container body closed by a threaded cap-like telescoped capsule closure member which forms a separate chamber with a perforated wall of the container body for receiving a frangible foil bag having a second liquid com-



ponent adapted to be broken by pressing the closure member against the container body so as to cause the liquid component to flow through the perforated wall and mix with the first component in the container body.

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**3,655,036**

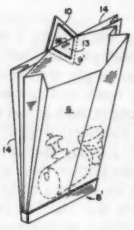
**LITTER BAGS AND DISPENSER COMBINATION**

**Robert Corelli, and Olga V. Corelli, both of 35 West 74th Street, New York, N.Y.**

**Filed Mar. 2, 1970, Ser. No. 15,720**

**Int. Cl. B65h** *55/00*

**U.S. Cl. 206—57 A** **3 Claims**



A litter bag and dispenser combination. A holder for bags is provided with a self-adhesive coated hanging tab for securing to a supporting surface. A plurality of litter bags folded in accordion-like fashion are secured to the holder. Perforations provided in the top portions of the bags make it possible to tear off successive bags after each one has been filled with litter.

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**3,655,037**

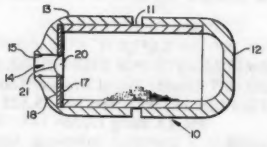
**DOUBLE CHAMBERED CONTAINER**

**Maurice G. Lussier, 222 Maple Street, Lynn, Mass.**

**Filed Sept. 30, 1968, Ser. No. 763,773**

**Int. Cl. A61b** *19/02*

**U.S. Cl. 206—635** **5 Claims**



A double-chambered cylindrical vial for separately containing co-reactive materials is composed of a closed capsule

having a fitst storage chamber for one of the co-reactants and a rupturable chamber located adjacent one of the ends of said capsule. The capsule end is characterized by a corridor therein closed to the first chamber by a rupturable wall or membrane. The capsule is activated by inserting into said corridor a pin or piston of sufficient diameter to close the corridor and which ruptures the second chamber thereby expelling all of the contents of said second chamber into the first chamber thus permitting the co-reaction of the materials.

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**3,655,038**

**METHOD FOR IMPROVING THE BRIGHTNESS OF GRAY SEDIMENTARY KAOLIN CLAY**

**Venancio V. Mercade, Metuchen, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Woodbridge, N.J.**

**Filed Feb. 12, 1970, Ser. No. 11,008**

**Int. Cl. B03b** *1/04, 1/02*

**U.S. Cl. 209—5** **10 Claims**

An improvement in a process for brightening gray sedimentary kaolin clay by oxidizing an aqueous pulp of the clay with ozone and subsequently removing Titania from a deflocculated pulp of the clay by flotation. A basic reagent capable of reducing the calcium ion concentration of the pulp is added after the ozone treatment and before the flotation treatment.

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**3,655,039**

**SEPARATING DEVICE FOR SEPARATING METALLIC MATTER FROM NON-METALLIC MATTER**

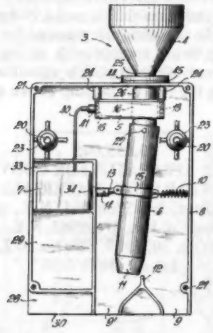
**Guntram Kind; Karl-Heinz Schroder, both of Windhagen, and Rido Busse, Oberelchingen, all of Germany, assignors to Pulsotronic Merten KG, Gummersbach (Rhld.), Germany**

**Filed Nov. 19, 1969, Ser. No. 878,113**

**Claims priority, application Germany, Nov. 20, 1968, P 18 09 982.6**

**Int. Cl. B07c** *5/344, 3/02*

**U.S. Cl. 209—74** **27 Claims**



A funnel-shaped admitting hopper for material to be separated communicates with a tubular conduit which is swingably mounted so that its outlet, remote from the admitting hopper, can be placed into registry with one of two openings for discharging into them metallic and non-metallic matter, respectively. A metal detector is located proximal to the conduit for detecting metallic matter as the same passes through the conduit. Biasing means normally urges the conduit to a position where its outlet communicates with the opening into which non-metallic matter is to be discharged. An actuating device is associated with the conduit and is responsive to detection of the metal by the metal detector, whereupon it deflects the conduit so that the outlet thereof registers with the opening into which metallic matter is to be discharged. On deactivation of the actuating means the biasing means returns the conduit to its normal position.

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**3,655,040**

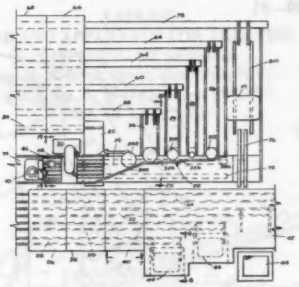
**TABLEWARE SORTING SYSTEM**

**William E. Gay, 269 Pleasant Drive, Warren, Pa.**

**Original application Oct. 27, 1967, Ser. No. 678,592, now Patent No. 3,520,576. Divided and this application Apr. 24, 1970, Ser. No. 43,295**

**Int. Cl. B07c** *1/10, 5/342*

**U.S. Cl. 209—75** **14 Claims**



Several embodiments of automatically operated dish, holloware and silverware sanitizing apparatus, and methods performed thereby for successively cleansing, sterilizing and drying dish items, silverware, and holloware items such as cups ans glassware after the same have been classified and segregated for movement through separate paths in appropriate baths and atmospheres to accomplish the sanitizing steps, followed by assembly of such items respectively into vertical stacks of dish items, containers of silverware, and trays containing closely assembly rows of inverted holloware items for storage and reuse, one of the embodiments of apparatus including automatically operable means to classify and separate a heterogeneous mixture of such items into individual rows of similar dish items classified according to type, similar holloware items classified according to size, and silverware classified according to item.

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**3,655,041**

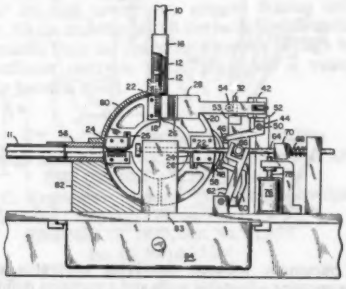
**ELECTRONIC COMPONENT HANDLER AND TESTER**

**Alexander Baker, Delran, N.J., and Eugene A. Vosika, New Brighton, Minn., assignors to Integrated Mechanical Systems, Inc., Minneapolis, Minn.**

**Filed Apr. 23, 1970, Ser. No. 31,264**

**Int. Cl. B07c** *5/344*

**U.S. Cl. 209—81** **11 Claims**



A machine to handle integrated circuits is disclosed wherein the circuits slide into slots in a wheel with the leads

along side the wheel. Kelvin type contacts engage these leads and connect the integrated circuit to suitable testing circuits. The wheel then rotates a quarter turn to where the circuit is ejected into a storage tube if the testing circuits so indicate. If not the circuit falls out of the wheel during the next quarter turn into a reject bin.

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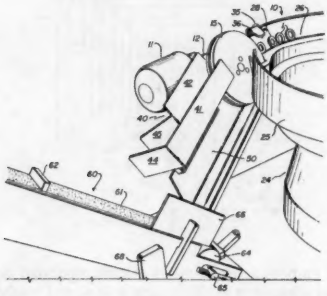
**3,655,042**

## PARTS GAGER

**Gerald R. Grafius, Erie, Pa., assignor to Automatic Devices, Inc., Fairview, Pa.**

**Filed Dec. 1, 1970, Ser. No. 94,121**
**Int. Cl. B07b *13/04***
**U.S. Cl. 209—91** **8 Claims**



Disclosed is a parts gager which is made up of a vibratory bowl feeder which delivers parts to a rotating gage wheel having a wedge face and a slotted interior portion. The gage wheel receives those parts which are oversized, bent, doubled, or otherwise unacceptable and carries the same to a reject chute; failing to accept those parts which are considered usable and drop into a discharge chute. The accepted parts are fed on to a conveyor belt with cleated members for delivery for further assembly. The rejected parts are dropped into a reject receptacle for further processing or scrapping.

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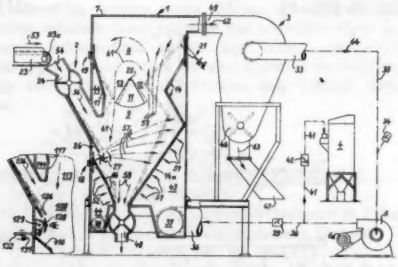
**3,655,043**

## PNEUMATIC TOBACCO CLASSIFYING APPARATUS

**Waldemar Wochnowski, and Heinz Friebel, both of Hamburg, Germany, assignors to Hauni-Werke Korber & Co. K.G., Hamburg, Germany**

**Filed June 5, 1970, Ser. No. 43,734**
**Claims priority, application Germany, June 26, 1969, P 19 32 312.7**
**Int. Cl. B07b *7/01***
**U.S. Cl. 209—138** **18 Claims**



A pneumatic tobacco classifying apparatus wherein a tower contains adjustable walls and a partition defining upper and lower classifying chambers connected by two discrete channels. An adjustable chute admits a mixture of tobacco ribs and tobacco leaf laminae into the range of an accelerating device, such as a driven winnower roller or an air-discharging nozzle, which is mounted in the lower chamber and serves to propel the particles of the mixture across the lower chamber against one of the adjustable walls to thus break up agglomerations of ribs and laminae. An ascending air current entrains the laminae and some ribs into the upper chamber, mainly by way of the channels, whereby the entrained ribs descend mainly by way of the other channel and are again propelled by the accelerating device. The heavier ribs descend immediately into and are evacuated from the bottom zone of the lower chamber. The laminae are separated from the air current after leaving the upper chamber.

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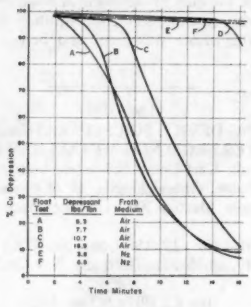
**3,655,044**

## SEPARATION OF MOLYBDENUM SULFIDE FROM COPPER SULFIDE WITH DEPRESSANTS

**John F. Delaney, Tucson, Ariz., assignor to The Anaconda Company, New York, N.Y.**

**Filed Jan. 20, 1970, Ser. No. 4,356**
**Int. Cl. B03d *1/06***
**U.S. Cl. 209—167** **6 Claims**




Molybdenum sulfide is separated from a molybdenite-containing copper ore concentrate by subjecting an aqueous pulp of the concentrate to froth flotation in the presence of a collector for molybdenum sulfide and a Nokes-type (e.g., arsenic trioxide/sodium sulfide) depressant for copper sulfide, the aqueous pulp being aerated with an inert gas to effect flotation of the molybdenum sulfide constituent of the pulp while maintaining the emf of the pulp above about minus 200 millivolts.

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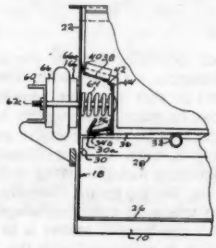
**3,655,045**

## METHOD AND APPARATUS FOR CONVEYING AND SEPARATING MATERIALS

**George F. McAllister, Jr., Westfield, N.Y., assignor to Ajax Flexible Coupling Co. Inc., Westfield, N.Y.**

**Filed Oct. 30, 1969, Ser. No. 872,619**
**Int. Cl. B07b *1/50***
**U.S. Cl. 209—379** **17 Claims**



A screen is removably supported above the bottom of a reciprocable conveyor on longitudinally extending supports.

Means for stretching the screen includes a plurality of air bags connected to the longitudinal edges of the screen. When the air bags are inflated the screen is stretched transversely and also held against portions of the support means. The air bags may be periodically deflated and again inflated while the conveyer is operated to allow the screen to loosen and impact against the support dislodging material lodged in the interstices of the screen to eliminate blinding.

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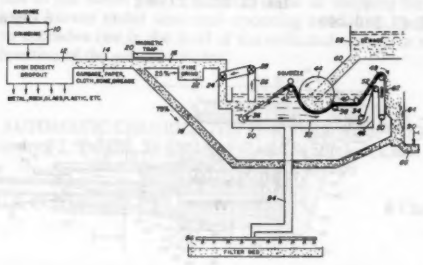
**3,655,046**

**MUNICIPAL WASTE DISPOSAL**

**Harry B. Trussell, Carthage, Mo., assignor to Fermbionics, Inc., Joplin, Mo.**

**Filed Mar. 11, 1970, Ser. No. 18,505**
**Int. Cl. C02c *1/02***
**U.S. Cl. 210—11** **10 Claims**



A system for disposing of municipal waste including garbage and sewage which converts the garbage portion into a matrix filter which is used to separate the liquids and solids in the sewage. The liquids are purified in a normal manner, for example by aeration, and the solids are converted into a food material suitable for livestock consumption.

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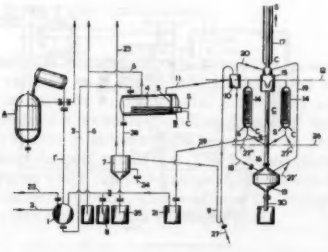
**3,655,047**

**PROCESS FOR THE PURIFICATION OF WASTE WATER**

**Marco Adegeest, Zandvoort, Netherlands, assignor to Corodex, N.V., Zandvoort, Netherlands**

**Filed Nov. 6, 1970, Ser. No. 87,557**
**Int. Cl. C02c *5/02***
**U.S. Cl. 210—59** **7 Claims**



Removal of impurities from waste waters resulting from the manufacture of phenol/formaldehyde resins. Add at least one phenol to waste water, in quantity sufficient to bring phenol:formaldehyde molar ratio to from 1:1.02 to 1:1.12; adjust normality to from 0.015 to 0.10 N; heat for prolonged time at 80°–85° C., thus evaporating lower-boiling solvents; evaporate water at temperatures between 5° below boiling point of solution and 116° C.; recover liquid resin substantially free of resite, using finely divided air to aid evaporation of remaining solvents, if desired. Suitable apparatus includes a mixing tank with lines to feed it with contaminated water, acid, and phenol. The tank discharges to a heatable reservoir which has a gravity drain to a settling tank as well as an offtake for gaseous products and a bleed-off line from an intermediate zone for conveying fluids to an overflow tank. That tank has a return line to the reservoir and a gravity drain for liquid resin. It is connected also to an expansion boiler which is heated by fluid from heat exchange units. A stack removes vapor upwardly and a gravity drain conducts liquid resin downwardly to a storage vessel. A bleed-off line from an intermediate zone in the last mentioned drain to an acid recovery vessel may be added, if desired. Air injectors are installed as needed to maintain circulation.

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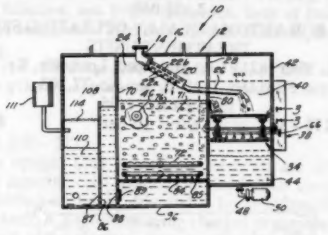
**3,655,048**

**METHOD AND APPARATUS FOR TREATING AND DISPOSING OF SEWAGE**

**Nicola F. Pergola, 87 89th Street, Brooklyn, N.Y.**

**Filed Jan. 8, 1971, Ser. No. 104,995**
**Int. Cl. C02c *1/12***
**U.S. Cl. 210—67** **11 Claims**



A method and apparatus for treating and disposing of sewage which includes introducing raw sewage into a liquid separator. Separating liquid sewage from the solid sewage and collecting the separated liquid in a collection reservoir. The solid sewage is passed onto a filtration conveyor where the carry over liquid is filtered by the conveyor into a filtration reservoir and the solid sewage is transported to an incinerator. The liquid in the filtration reservoir is recirculated to the collection reservoir. Air supply and diffusion device introduces diffused air into the liquid in the collection reservoir to carry suspended solid sewage therein to the surface of the liquid in the collection reservoir. The liquid and solid sewage on the surface of the collection reservoir is passed over a weir onto the filtration conveyor where the filtration, transportation, recirculation and incineration steps are repeated. The diffusion of air into the liquid, the passing of the liquid and the solid sewage onto the filtration conveyor and the recirculation of the liquid is continued for a set period of time after the raw sewage has stopped flowing into the separator. At the termination of the recirculation cycle, the liquid is passed from the collection chamber through baffles into an effluent reservoir where the liquid is treated to reduce the bacteria count.

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**3,655,049**

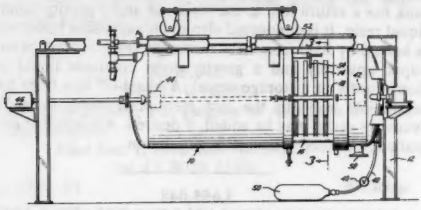
**METHOD AND APPARATUS FOR RETAINING AND DISLODGING FILTER CAKE**

**Aloysius C. Kracklauer, Conroe, Tex., assignor to Sparkler Manufacturing Company, Conroe, Tex.**

**Filed Nov. 19, 1970, Ser. No. 91,097**
**Int. Cl. B01d *25/34***
**U.S. Cl. 210—81** **8 Claims**

A porous screen fitted adjacent a vertical plate filter, in close proximity therewith, and means for oscillating or agitating the screen are provided, so that the screen acts to

dislodge the filter cake which builds up on the filter plate. A method of dislodging a filter cake is provided which includes oscillation of a screen located adjacent a vertical plate filter



having filtering media thereon for filtering fluids, and then continued oscillation of the screen while at the same time expanding the filtering media toward the screen and washing the filtering media with water.

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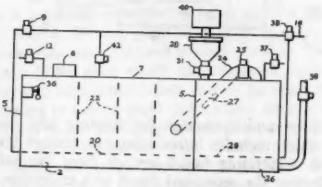
**3,655,050**
**MEANS FOR AUTOMATICALLY OPERATING SEWAGE TREATMENT UNITS**
**Rolland L. Fifer, 6211 Glen Hill Road, Louisville, Ky.**
**Filed Oct. 1, 1970, Ser. No. 77,203**
**Int. Cl. C02c *1/06***
**U.S. Cl. 210—86** **8 Claims**



Means are provided for operating the sewage treatment units described in U.S. Pat. Nos. 3,476,250 and 3,460,677 completely automatically. Two timed operating cycles are employed. A purifying chemical is injected to the purified effluent from a chemical dispenser. The dispenser is filled from a hopper. It is necessary only to add purifying chemical to the hopper when a signal is activated indicating that the hopper is empty.

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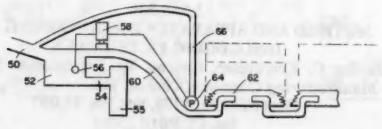
**3,655,051**
**UNDERWATER STORAGE SYSTEM**
**Harold Gerson Quase, Kensington, Md., assignor to Underwater Storage, Inc., Washington, D.C.**
**Filed June 23, 1969, Ser. No. 835,655**
**Int. Cl. B01d *21/24***
**U.S. Cl. 210—88** **5 Claims**



An underwater storage system collects waste, measures the collection and stores the waste in underwater storage tanks from whence the material is pumped when inlet measurement indicates the necessity. Automatic systems are provided for the storage of sewage waste during peak periods and in large flexible walled tanks having flat rectangular bottoms with horizontal oriented inlet and outlet means. When the peak systems are passed, the present invention provides automatic means to reintroduce the stored sewage into the sewage treatment system. The automatic waste, collection, storage and emptying systems and the flexible containers used in those systems have particularly useful application to sewage systems.

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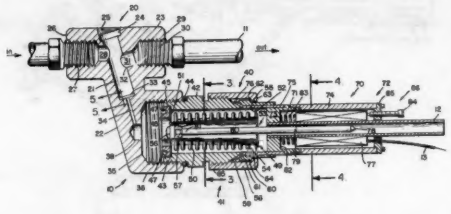
**3,655,052**
**FLUID CONTAMINATION MEASURING SYSTEM**
**Josef E. Friederichs; Edgar E. Friederichs, both of Pacific Palisades, and Leo Weg, Los Angeles, all of Calif., assignors to Alpha Advanced Systems, Inc., Inglewood, Calif.**
**Filed Feb. 6, 1970, Ser. No. 9,262**
**Int. Cl. B01d *33/06***
**U.S. Cl. 210—90** **6 Claims**



A fluid contamination measuring system having a sampling valve to continuously withdraw a representative portion of a fluid stream, a moveable filter for filtering at least some of such stream portion and moving proportionally to the cumulative amount of particles retained and a sensor for detecting such movement remotely.

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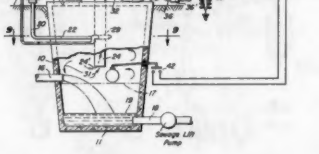
**3,655,053**
**SEWAGE LIFT STATION**
**Adolph C. Hugin, 7602 Boulder Street, North Springfield, Va.**
**Filed Feb. 16, 1971, Ser. No. 115,380**
**Int. Cl. B01d *57/00***
**U.S. Cl. 210—152** **20 Claims**



Sewage lift stations comprising a tank or well into which sewage flows through an inlet a suitable height above the bottom of the tank to provide for collection of a desired quantity of sewage after which it is automatically pumped out of the tank to a higher level from which it flows by gravity to the next lift station or to a treatment plant or other disposal system. A sewer gas deactivation and deodorizing unit comprising a suitable heating and burning unit utilizing, as the primary source of heat, a gas burner which may either simply heat the sewer gas as it is drawn from the tank by a blower and blown through the heating unit or which may premix the

sewer gas and the air and gas supplied to the burner so that the mixed gas burns directly. Air is supplied to the tank from the atmosphere through a relatively small inlet pipe at a point adjacent to the inner wall of the tank through an inlet opening or nozzle extending substantially peripherally horizontally preferably about one-fourth to one-third of the depth of the tank down from the top so as to direct air peripherally over the inner wall surface of the tank in order to produce a circulatory scavenging flow of mixed air and gas in the tank over the exposed part of this surface. The mixed air and gas is withdrawn from the tank through an exhaust pipe which is relatively much larger than the air inlet and which has intake preferably at about one half the depth of the tank and centrally thereof a predetermined distance above the maximum height of sewage in the tank. This assures a good mixture of the air and sewer gas before it is withdrawn and places the gas exhaust intake at or near the center of a vortex circulation of the mixed gas. Provision is made for stopping the exhaust blower under abnormal operating conditions, such as an excessive rise in the level of the collected sewage or nonfunction of the gas deactivator.

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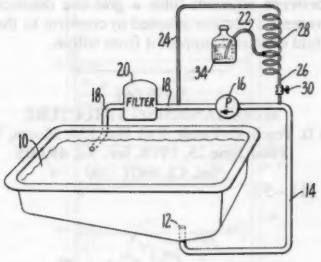
**3,655,054**

## AUTOMATIC CHLORINATOR FOR SWIMMING POOLS

**Andrew L. Pansini, 27 Larkspur Street, San Rafael, Calif.**

**Filed May 25, 1970, Ser. No. 40,100**
**Int. Cl. E04h *3/16***
**U.S. Cl. 210—169** **6 Claims**




An automatic non-electric which employs powdered or granular chlorine in a submerged condition and which is operable in response to deactivation followed by activation of the pump of a swimming pool recirculating and water treatment system to automatically inject a given amount of chlorine into the pool return line. This is accomplished by a by pass system which comprises an air tight reservoir for containing treatment solution, a loop of pipe for storage which bypasses a suction line from a swimming pool.

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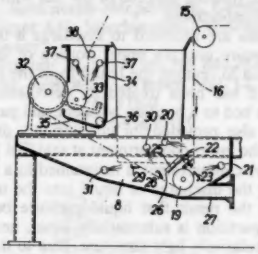
**3,655,055**

## BAND FILTER PRESS

**Richard Van Egdom, Bahnhofstrasse 45, 5164 Noervenich, and Alfons Schotten, Rurstrasse 13, 516 Dueren, both of Germany**

**Filed July 2, 1970, Ser. No. 52,045**
**Claims priority, application Germany, Dec. 9, 1969, P 19 61 608.1**
**Int. Cl. B01d *33/00***
**U.S. Cl. 210—225** **11 Claims**

A cleaning arrangement comprising several fan spray nozzles and scrapers for cleaning both surfaces, and the entire width, of the filter band, in a vertical filter press, between the




outlet end of the band from the filter plates and the drive roller for the band.

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**3,655,056**

## FILTER ELEMENT FOR UPRIGHT FILTER PRESS

**Alfons Schotten, and Franz Heimbach, both of Dueren, Germany, assignors to Eberhard Hoesch & Sohne, Duren, Germany**

**Filed Apr. 23, 1970, Ser. No. 31,288**
**Claims priority, application Germany, Dec. 8, 1969, G 69 47 461.9**
**Int. Cl. B01d *25/00***
**U.S. Cl. 210—227** **9 Claims**

In an upright filter press filter elements are arranged in stacked superimposed relationship. Each filter element has a frame having an upper side and a lower side and carrying filter means. A liquid-conveying channel is provided in each frame and terminates at a lateral side thereof for conveying expressed liquid. A lateral tubular extension is provided on each frame having a lower portion protruding downwardly beyond the lower side and a passage oriented in upright direction and communicating with the channel. The passage has at the upper side of the frame an inlet whose inner diameter is larger than the outer diameter of the lower portion so that the lower portion of the extension on the respectively upper filter element is telescopically receivable in the inlet of the passage of the extension of the respectively lower filter element.

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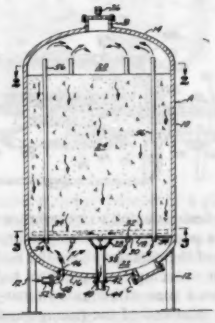
**3,655,057**

## TANK STRUCTURE

**George Dennis Hume, 6741 Loyola Drive, Huntington Beach, Calif.**

**Filed Feb. 20, 1970, Ser. No. 13,082**
**Int. Cl. B01d *23/10***
**U.S. Cl. 210—288** **5 Claims**



A vertically disposed high pressure tank having upper and lower convex ends, and a flat horizontal partition within the tank adjacent the lower end thereof that cooperates with the

tank to define an upper and a lower compartment. The partition serves as a base to support a bed of media such as zeolite, sand, filtering material or the like within the confines of the first compartment.

First means are provided to discharge a liquid at a first desired pressure into the upper portion of the upper compartment and to remove the liquid from the confines of the tank after it has been treated by percolating downwardly through the bed to a position adjacent said partition. Second means are also provided for concurrently discharging said liquid into the lower compartment at said first pressure.

Said lower compartment is maintained in a flooded condition during the discharge of liquid into the upper compartment, with the result that liquid pressure both above and below the partition is substantially equal, and the partition may be of relatively light structure. Due to this equalization of pressures, above and below the partition, no heavy reinforcing means for the partition are required in the lower compartment.

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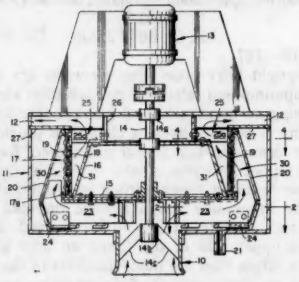
**3,655,058**
**FILTRATION APPARATUS**
**Richard A. Novak, 20 Chestnut Street, Boston, Mass.**
**Filed July 13, 1970, Ser. No. 54,507**
**Int. Cl. B04b** *5/12*
**U.S. Cl. 210—360** **10 Claims**



A filtration apparatus which includes a rotating filter, a compressor or blower for providing a positive fluid flow to the rotating filter, and an expander or turbine for extracting energy from the fluid after it has been filtered.

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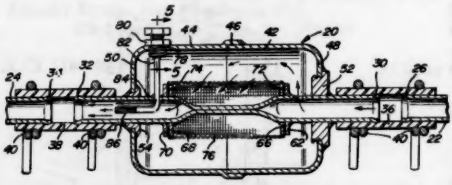
**3,655,059**
**IN-LINE FUEL FLOW RESTRICTING AND FILTER ASSEMBLY**
**Arthur O. Johnson, 212 N.E. 26th Street, Miami, Fla.**
**Filed May 14, 1970, Ser. No. 37,147**
**Int. Cl. B01d** *35/00*
**U.S. Cl. 210—446** **13 Claims**



A tubular body adapted to be interposed in a fuel flow line and having a passage formed longitudinally therethrough. A mid-portion of the passage within the body has a flow restrictive zone for reducing fluid pressure pulses and the tubular body includes a zone of increased cross-sectional area intermediate the inlet end of the passage and the flow restrictive zone of the passage for further reducing fluid pressure pulses. Also, one form of the invention provides a pair of spaced flow restrictive zones intermediate the inlet and outlet ends of the passage with the zone of increased cross-sectional area disposed between the pair of flow restrictive zones. Finally, each of the tubular bodies has a filter body through which fuel flowing through the tubular body must pass and a check valved air inlet for ambient air is provided and has its outlet end disposed in position subject to reduced fluid pressures in response to fuel flow through the tubular body.

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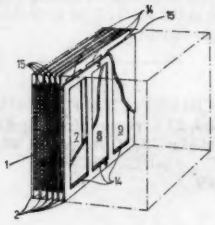
**3,655,060**
**GAS OR LIQUID FILTER**
**Erik Lennart Hagdahl, Bergsatra, Sweden, assignor to Stora Kopparbergs Bergslags Aktiebolag, Falun, Sweden**
**Filed Mar. 3, 1970, Ser. No. 16,126**
**Claims priority, application Sweden, Mar. 5, 1969, 3050/69**
**Int. Cl. B01d** *29/06*
**U.S. Cl. 210—493** **7 Claims**



A gas or liquid filter structure comprising a fibrous filter web arranged in alternating folds and in which there is positioned between adjacent folds a grid-like distance member which presents a portion adapted to conform to the contours of each fold edge and support it from within.

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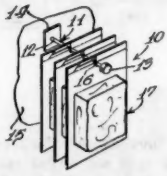
**3,655,061**
**MERCHANDISING STRUCTURE**
**Andreas D. Peschcke-Koedt, P.O. Box 134, Moose, Wyo.**
**Filed June 25, 1970, Ser. No. 49,605**
**Int. Cl. A47f** *7/00*
**U.S. Cl. 211—57** **12 Claims**



A merchandising structure having a plurality of packages carried on a spindle for selective removal by a customer. The spindle includes means at the distal end preventing withdrawal of the packages over the distal end. The packages include means preventing simple lateral withdrawal of the package from the spindle so as to avoid pilfering. Means are provided for manually rearranging the package for subsequent lateral withdrawal so that operation of the last named means inhibits pilfering by necessitating an additional readily observable operation.

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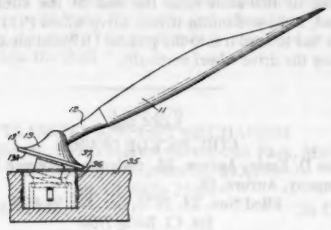
**3,655,062**
**PENHOLDER ASSEMBLY**
**James E. Curry, Pawtucket, R.I., assignor to A. T. Cross Company**
**Filed July 10, 1970, Ser. No. 53,783**
**Int. Cl. A47f** *7/00*
**U.S. Cl. 211—69.6** **3 Claims**

A penholder assembly having a funnel adaptor pivotally

mounted in the top of a bonnet and a stem attached to the bottom of the bonnet having either an annular boss or annular groove which is gripped by resilient coupling means that are mounted in a bushing which releasably receives the stem.



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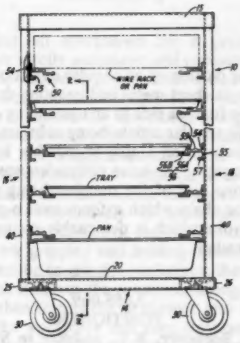
**3,655,063**

**TRAY AND PAN SUPPORTING RACK**

**Thomas J. Landry, Old Lyme, Conn., assignor to AMP Incorporated**

**Filed Aug. 27, 1970, Ser. No. 67,509**
**Int. Cl. A47f 3/14, 47/00**
**U.S. Cl. 211—71** **1 Claim**



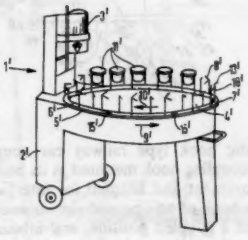
A rack including a frame and tray supporting members. The frame includes a top member spaced above and in registry with a base member, and four vertical posts respectively connected to the opposed corners of the base and top members; and wherein two of the posts have vertically oriented keyhole-shaped slots, and the other two have horizontally oriented keyhole-shaped slots. Each of the tray supporting members is an extrusion having a base provided with two rivets with enlarged free ends or heads. The rivets are spaced apart a lesser distance than the enlarged parts of the keyhole-shaped slots into which the rivet heads must be inserted to connect the member to two of the posts. As a result, to mount a member on the posts, the rivet which is to be inserted in a horizontally oriented slot must first be so inserted, then the member must be moved horizontally toward the post with vertically oriented slots before the other rivet can be inserted in the appropriate vertically oriented slot and moved downwardly. When mounted, the members cannot be sidewise or endwise moved without first upwardly lifting their ends which are associated with vertically oriented slots.

**3,655,064**

**ADJUSTABLE POT HOLDING MEANS FOR POTTING AND REPOTTING MACHINES**

**Georg Mayer, Heidenheim-Mergelstetten, Germany, assignor to Firma Mayer KG, Maschinenbau, Heidenheim-Mergelstetten, Germany**

**Filed July 25, 1969, Ser. No. 844,868**
**Claims priority, application Germany, Sept. 12, 1968, P 17 82 516.0**
**Int. Cl. A47g 29/00**
**U.S. Cl. 211—78** **22 Claims**



Pot holding means for filling pots or other containers such as with plant receiving material for the subsequent placement of plants therein. The pot holding means comprises two concentric rings, each having a set of brackets thereon which are spaced for appropriate engagement of pots by relative rotative movement of the rings with respect to each other. The rings may then be locked in position with the pots suitably insertable and removable from the brackets and the whole assembly rotated or otherwise moved for introducing the pots to a filling station.

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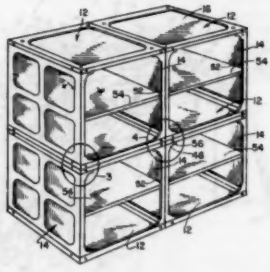
**3,655,065**

**KNOCKDOWN CUBE STRUCTURE**

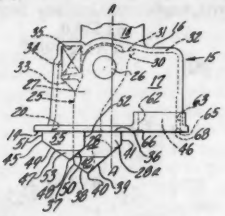
**Bernard Yellin, 5252 S. Kolman Avenue, Wilmette, Ill.**

**Filed Dec. 9, 1970, Ser. No. 96,315**
**Int. Cl. A47f 5/10**
**U.S. Cl. 211—177** **10 Claims**



A knockdown cube member formed of a plastic material and comprising a top member and a bottom member, each integrally formed and being of identical construction, and a pair of side members being of identical construction, so that said top, bottom and side member may be readily assembled to form a cube and wherein said cube may be used either individually or to form a module which is readily connected to other similar cubes.

**3,655,066**
**RAILWAY CAR COUPLER**
**William J. Metzger, East Cleveland, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio**
**Filed Oct. 30, 1970, Ser. No. 85,382**
**Int. Cl. B61g** *3/02, 3/10*
**U.S. Cl. 213—100 W** **15 Claims**



An automatic hook type railway car coupler having a spring biased coupling hook mounted in its head for horizontal pivotal movement and adapted for interlocking engagement with the hook of an opposed similar coupler when the couplers are in a coupled position, and inboard projections and pocket portions disposed on opposite sides of the longitudinal central axis of the coupler adapted to mate with complementary means on the opposed similar coupler for interlocking the couplers both vertically and horizontally when they are in a coupled position, More particularly, the coupling hook and inboard projections each have a forwardly extending tapered portion defining first nd second lateral alignment means, respectively, adapted to provide a more compact arrangement of guiding surfaces for improving the lateral gathering characteristics of two opposed misaligned couplers approaching each other during a coupling operation.

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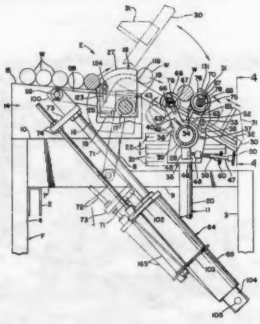
**3,655,067**
**BAR FEEDER AND ESCAPEMENT DEVICE**
**Frank F. White, Shaker Heights, Ohio, assignor to Automation Development Corporation, Lake County, Ohio**
**Filed Apr. 20, 1970, Ser. No. 29,863**
**Int. Cl. B65h** *51/26*
**U.S. Cl. 214—1 PB** **18 Claims**



An automatic bar feeder for a centerless grinder having conventional adjustable bar-supporting rollers (68) carried by a long vertically adjustable horizontal guide tube (28), a feed ramp (14), an escapement shaft (17), a plurality of long narrow load arms (30) on said shaft having long adjusting slots (32) for mounting adjustable bar-engaging stops (31), adjustable escapement plates (18) on said shaft to lift one bar only from the ramp to the load arms, a high-speed pneumatic cylinder (69) for turning the escapement shaft rapidly to cause the escapement plates to throw the lowermost bar (W) on the ramp outwardly at a high speed such that it clears the nearest roller (68) and engages the stops (31) before the arms are lowered below said rollers (68), hydraulic cylinder means (165) for retarding and controlling the speed of lowering of the arms near the end of the stroke of said cylinder, a skewed motor-driven drive wheel (92) for engaging the bar to feed it into the grinder (B), and means (94) for swinging the drive wheel vertically.

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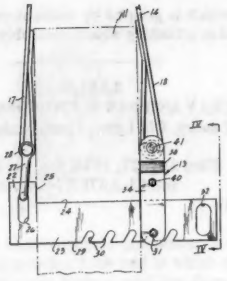
**3,655,068**
**COIL PICKUP DEVICE**
**William D. Ervin, Aurora, Ill., assignor to Aurora Equipment Company, Aurora, Ill.**
**Filed Nov. 23, 1970, Ser. No. 91,879**
**Int. Cl. B65g** *7/00*
**U.S. Cl. 214—1 QD** **11 Claims**



A device for picking up an annular object or article such as a coil or wire or sheet metal and enabling the tipping of the annular article from its side to an upstanding orientation with the axis of the annular article being substantially horizontal. The device includes an L-shaped member having a support surface for engaging an inner circumference of the annular article with one end of the member being connected to a flexible belt or chain which extends over a pulley and is attached to a yoke which is detachably secured to the other end of the member.

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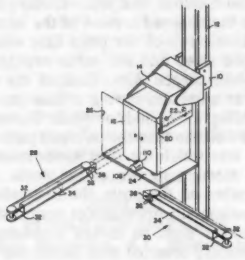
**3,655,069**
**POSITIONER**
**Kai Gertsen, Rochester, N.Y., assignor to Sybron Corporation, Rochester, N.Y.**
**Filed Dec. 22, 1969, Ser. No. 886,844**
**Int. Cl. B66c** *1/04*
**U.S. Cl. 214—1 BT** **10 Claims**



The invention is a positioner for use with a material handling system wherein wheeled containers are transported

through vertical or horizontal shaftways. The positioner includes a conveyor driven boom which can be moved into the shaftway. The boom has magnets nested in one end, which can be cammed outwardly for attachment to the container after the boom has been driven into the shaftway. Reversing the conveyor withdraws the boom and, therefore, the container from the shaft. The positioner is also used to insert containers into the shaft.

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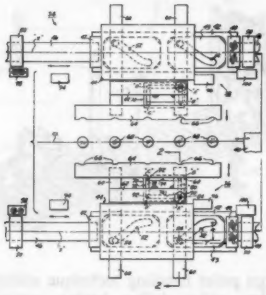
**3,655,070**
**TRANSFER AND LIFT MECHANISM**
**Bartley A. Haydu, 22111 Marlow Street, Oak Park, Mich.**
**Filed Apr. 7, 1969, Ser. No. 813,999**
**Int. Cl. B65g** *25/04*
**U.S. Cl. 214—1 BB** **36 Claims**



A transfer and lift mechanism for a press or similar machine which is wholly automatic and operates on a multiple cam principle comprising, primarily, a machine base on which is mounted a slide assembly provided with one or more cams or tracers mounted for movement along a predetermined path to move a work gripping and holding assembly in traverse, vertical and longitudinal direction. The cam or tracer unit is designed such as to enable it to move the work gripping and holding assembly within the above directions of movement either consecutively or simultaneously. By a proper design and combination of various cam tracer and lifting units, the work gripping and holding assembly advances in a traverse direction to grip the workpiece, then moves vertically after which it moves the workpiece along in a longitudinal direction, then lowers the workpiece into the next station to release the workpiece and then traverses out of the work area. The last move is in a direction to return the assembly to its initial position to complete one cycle.

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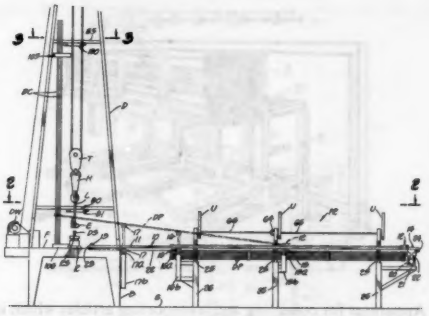
**3,655,071**
**HORIZONTAL PIPE RACKING AND HANDLING APPARATUS**
**Faustyn C. Langowski, and John W. Turner, Jr., both of Houston, Tex., assignors to Byron Jackson, Inc., Long Beach, Calif.**
**Filed May 27, 1970, Ser. No. 40,986**
**Int. Cl. E21b** *19/14*
**U.S. Cl. 214—2.5** **3 Claims**

Horizontal pipe racking and handling apparatus in which stands of drill pipe are moved between horizontal racked positions and a position suspended at the center of a well drilling derrick, the horizontal rack supporting the pipe in vertical rows at opposite sides of line leading to the center of the derrick, and in which pipe stand racking and unracking apparatus includes a plurality of relatively shiftable pipe gripping and hoisting devices spaced longitudinally of the racked pipe so as to be operative to transfer pipe stands consisting of two joints or three joints of pipe. Each of the pipe transfer devices consists of a frame structure including a horizontally extended arm on which a carriage is shiftable, the carriage carrying vertically shiftable pipe stand engaging heads, and the carriages of all of the pipe transfer devices being driven by a common drive. In addition, the pipe handling apparatus includes a combined catcher and positioner for the lower end of the pipe stand as it approaches a vertical position in the derrick whereby to confine the lower end of the stand against undesired movement and to position the



stand above the drill string supported in the rotary table; the catcher and positioning device also being operable to engage and move the lower end of the drill collar between a position above the rotary table and a vertically racked position. The apparatus also includes an upper racker device for engaging and moving the upper end of the drill collars between a position above the rotary table and an offset vertically racked position.

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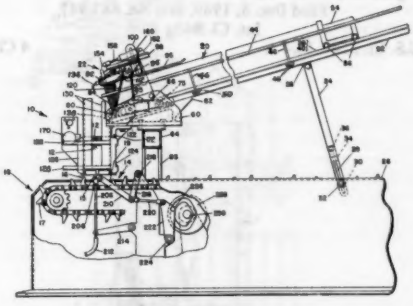
**3,655,072**
**CARTON HANDLING APPARATUS**
**Lawrence Giles Bateman, Toronto, Ontario, Canada, assignor to Delamere & Williams Company Limited, Toronto, Ontario, Canada**
**Filed Sept. 18, 1969, Ser. No. 859,135**
**Int. Cl. B65g** *59/06*
**U.S. Cl. 214—8.5 A** **19 Claims**



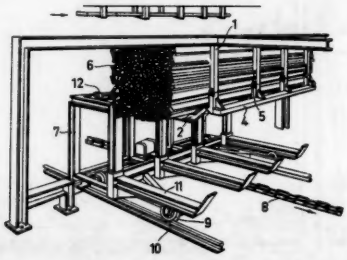
The apparatus includes a short upright magazine having a vertical stack of cartons from which successive lowermost cartons are withdrawn, and an elongated inclined supply magazine in response to a reduction in height of the stack whereby to maintain a substantially uniform supply therein to facilitate withdrawal of successive cartons and to require less frequent manual replenishment of the supply.

3,655,073

## ARRANGEMENT FOR COLLECTING MATERIAL AND REMOVING IT PERPENDICULARLY TO ITS LONGITUDINAL DIRECTION

Curt Erik Ingvar Andersson, Stora Tuna, Sweden, assignor to Kockum Soderhamn AB, Soderhamn, Sweden

Filed Mar. 24, 1970, Ser. No. 22,168
Int. Cl. B65g 65/02
U.S. Cl. 214—16 B 5 Claims



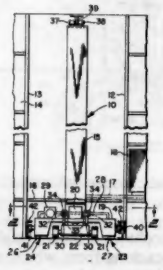
Apparatus for collecting and transporting articles which includes article receiving means that has bottom support arms which are movable between an article supporting position and an article discharging position. A releasable locking means permits the selective locking of the support arms in their article supporting position. A transport carriage is provided which is movable in a generally horizontal direction from a position directly below the article receiving means to an article unloading position. The carriage has a vertically adjustable platform with a means which is effective when the platform is raised to a predetermined height relative to the article receiving means to release the locking means and thereby permit movement of the support arms to their article discharging position. In addition, a means on the carriage restores the support arms to their article supporting position upon movement of the carriage from its position directly below the article receiving means to its unloading position.

3,655,074

## WAREHOUSE APPARATUS WITH AN AIRBEARING SUPPORTED STACKER

George R. Pipes, South Euclid, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 8, 1969, Ser. No. 882,917
Int. Cl. B65g 1/06
U.S. Cl. 214—16.4 A 4 Claims



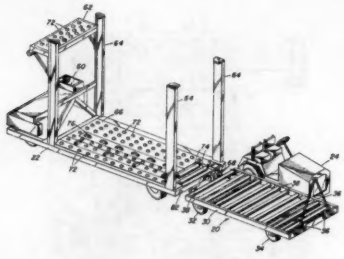
Relates to a storage and retriever stacker movable between a pair of storage racks for projecting or retracting a load into or off of the racks. The stacker is supported on air bearing means and is provided with means for horizontal guidance during movement between the racks.

3,655,075

## CARGO HANDLING

Frank B. Carder, Darien; Warren R. Stumpe, Stamford; Bruno S. Frassetto, Westport, and Charles H. Bell, New Canaan, all of Conn., assignors to Dorr-Oliver Incorporated, Stamford, Conn.

Original application July 21, 1967, Ser. No. 655,227, now Patent No. 3,506,144, dated Apr. 14, 1970. Divided and this application Apr. 13, 1970, Ser. No. 32,479
Int. Cl. B65g 67/10
U.S. Cl. 214—38 D 2 Claims



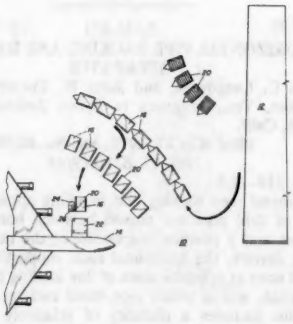
An air cargo pallet handling technique utilizing a mobile aircraft loader, pallet dollies having unpowered pallet transfer surfaces, and a dolly-maneuvering tractor having a hitch for side coupling with the dollies, the loader having a powered extractor to operate the transfer surface of a dolly positioned at the loader.

3,655,076

## CARGO HANDLING

Frank B. Carder, Darien; Warren R. Stumpe, Stamford; Bruno S. Frassetto, Westport, and Charles H. Bell, New Canaan, all of Conn., assignors to Dorr-Oliver Incorporated, Stamford, Conn.

Original application July 21, 1967, Ser. No. 655,227, now Patent No. 3,506,144, dated Apr. 14, 1970. Divided and this application Apr. 13, 1970, Ser. No. 32,478
Int. Cl. B65g 67/10
U.S. Cl. 214—38 BA 3 Claims



An air cargo pallet handling technique utilizing a mobile aircraft loader, pallet dollies having unpowered pallet

transfer surfaces, and a dolly-maneuvering tractor having a hitch for side coupling with the dollies, the loader having a powered extractor to operate the transfer surface of a dolly positioned at the loader.

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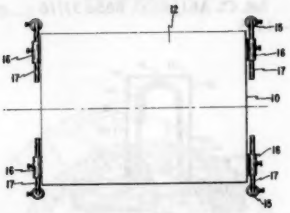
3,655,077
**CAR TOP CAMPING SHELTER**
Lyall Lowe, 517 Dakota Avenue, South Sioux City, Nebr.
Filed June 8, 1970, Ser. No. 44,088
Int. Cl. B60r 9/04
U.S. Cl. 224—42.1 E 5 Claims



Improvement in a car top carrier permitting its use as a camping shelter supported on the automobile and permitting removal of the car and support of the shelter on the ground.

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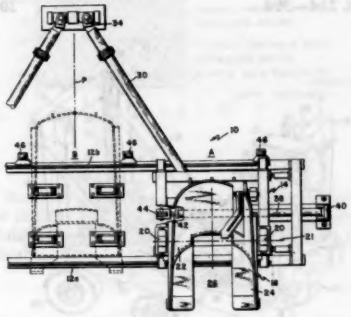
3,655,078
**ARTICLE ALIGNMENT DEVICE ON A PACKAGING MACHINE**
John L. Androkitis, Orwigsburg, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.
Filed June 12, 1970, Ser. No. 45,816
Int. Cl. B65g 57/00
U.S. Cl. 214—6 S 1 Claim

A stack of tile moving between the bagging machine and bag heat shrinking machine needs to be neatly stacked so that the end packaged product is neatly stacked. An automatic tile stacker is used to form a package of tiles into a uniformly appearing stack. A senser on the conveying line between the bagging machine and heat shrinking machine detects the presence of the stack of tile. This then operates a mechanical stop structure which aligns the forward and rearward surfaces of the stack of tile. The uniformly stacked tiles then proceed to the heat shrinking machine.

3,655,079
**COIL TRANSFER AND TIPPING APPARATUS**
Roger Kinnicutt, Jr., Worcester, and William J. Hill, Holden, both of Mass., assignors to Morgan Construction Company, Worcester, Mass.
Filed July 9, 1970, Ser. No. 53,469
Int. Cl. B65g 7/00
U.S. Cl. 214—146.5 4 Claims



An apparatus for receiving an inclined coil at a first station and for laterally shifting the coil to a second station while simultaneously tilting the coil to increase its angle of inclination.

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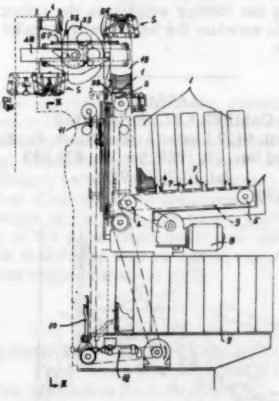
3,655,080
**CIGARETTE PACKER HOPPER AUTOMATIC FEEDING DEVICE**
Goffredo Gianese, Bologna, Italy, assignor to AMF Incorporated
Filed Mar. 11, 1970, Ser. No. 18,598
Claims priority, application Italy, June 17, 1969, 7107 A/69
Int. Cl. B65b 19/04
U.S. Cl. 214—302 14 Claims



An automatic cigarette packer hopper tray feeding device which comprises a tray for cigarettes, a feed conveyor and a container to receive the cigarettes from the tray, elevator

means to transfer a tray of cigarettes from the conveyor to a means to overturn the tray of cigarettes and position the cigarettes in an orderly manner in the container and to return the empty tray to the elevator.

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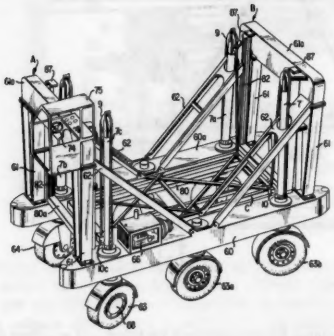
**3,655,081**
**STRADDLE CARRIERS**
**John Thomas Monk, 405 Meadon Moss Drive, Jackson, Miss.**
**Filed Feb. 6, 1970, Ser. No. 9,317**
**Int. Cl. B60p** *1/64*
**U.S. Cl. 214—394** **20 Claims**



The straddle carrier has two spaced parallel elongated frame members adapted to straddle a load. A pair of vertically disposed arch member connects the frame members together adjacent the ends thereof and diagonally disposed brace members connect the tops of the arches to substantially the mid-points of the frame members. Ground wheels are flexibly mounted on the undersides of the frame members, and means for steering the wheels are provided. A rectangular load lifting beam is disposed between the frame members and arches. Means are provided engaging the four corners of the lifting beam for raising and lowering the lifting beam, means being provided at the four corners of the lifting beam for securing same to a load. Means are also provided for guiding the lifting beam during its ascent and descent. And means are provided for controlling the lifting beam raising and lowering means whereby the four corners of the beam will be simultaneously raised or lowered equal amounts notwithstanding the relative weights on the respective corners, in order to maintain the beam always parallel with the frame members.

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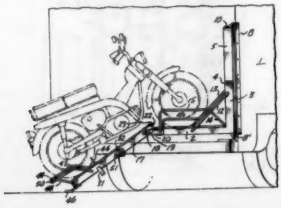
**3,655,082**
**CAMPER CYCLE CARRIER**
**Dennis J. Garrett, 9417 Linden Avenue North, Seattle, Wash.**
**Filed Nov. 10, 1969, Ser. No. 875,392**
**Int. Cl. B60n** *9/00*
**U.S. Cl. 214—450** **9 Claims**



A cycle-supporting base beam projects horizontally from the lower end of a dogleg supporting post pivoted on a mount attached to an automotive vehicle. The base beam is tilted sidewise away from the vehicle and wheel guards carried by the base beam and its supporting post are offset from the vehicle farther than the base beam to hold the wheels of a cycle so that the cycle leans away from the vehicle. The portion of the base beam remote from the supporting post is mounted to tilt downward from the post-attached portion of the base beam to provide a ramp for loading a cycle onto the carrier. The carrier can be swung away from the vehicle to facilitate loading and the base beam can be latched in position close alongside the rear of the vehicle during travel.

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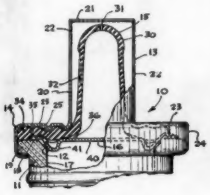
**3,655,083**
**INFANT FEEDING UNIT ASSEMBLY**
**Thomas Eberhardt, and William H. Welch, both of Columbus, Ohio, assignors to Abbott Laboratories, North Chicago, Ill.**
**Filed Jan. 8, 1970, Ser. No. 1,505**
**Int. Cl. A61j** *9/00;* **B65d** *51/16*
**U.S. Cl. 215—11 B** **2 Claims**



An infant feeding assembly including a nipple and a protective cap or shroud and retaining ring structure which clamps the assembly together onto the open end neck portion of a container. The protective shroud encloses the nipple during storage as well as compressing the nipple and closing the air vent holes. The assembly includes a disk for separating the product from the nipple and closure, the disk having biasing means on the periphery thereof capable of being resiliently flexed when the closure is attached to seal the container. Upon release of the pressure, the biasing means returns to its original configuration thereby releasing the vacuum within the bottle and facilitating the formation of an effective fluid flow path for the product in the container.

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**3,655,084**
**CONTAINER WITH PRESSURE RETAINING SEALING ELEMENTS**
**Werner Willhaus, Stuttgart-Kaltental, and Friedrich Scharf, Stuttgart-Stammheim, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany**
**Filed Dec. 15, 1970, Ser. No. 98,350**
**Claims priority, application Germany, Jan. 30, 1970, P 20 04 190.1**
**Int. Cl. B65d** *51/00*
**U.S. Cl. 215—37 R** **13 Claims**

A container with a material-dispensing portion is disclosed where the material-dispensing portion has an opening

disposed in a predetermined plane and has an endless surface, said surface being inclined to said plane. The container is in combination with a sheet-like sealing element having a marginal portion bonded to the surface of the container around the opening and having a median portion overlying the opening, the median portion being inclined with reference to the plane of the opening and making therewith an angle which, at most, slightly exceeds the angle between the plane of the opening and the endless surface of the material dispensing portion.

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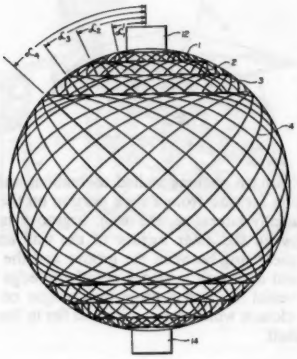
**3,655,085**

## FILAMENT WOUND SPHERICAL PRESSURE VESSEL

**Benjamin J. Aleck, Jackson Heights, N.Y., assignor to Arde, Inc., Paramus, N.J.**

**Filed Apr. 12, 1968, Ser. No. 721,019**
**Int. Cl. B65d 7/42**
**U.S. Cl. 220—3** **17 Claims**



A spherical, multi-layer, fibre reinforced plastic pressure vessel, each layer being a helix inclined at a different angle to the polar axis with each convolution in each layer following substantially a great circle, constructed so that the layer which extends closest to the poles of the sphere resists meridianal force of a given amount at a preselected horizontal plane, the layer most remote from the poles of said sphere resists, together with all other windings cooperating therewith, hoop force of said given amount along the equator, and the intermediate layers resist, together with the layers cooperating therewith, at selected horizontal planes only, either a meridianal force or a hoop force of said given amount.

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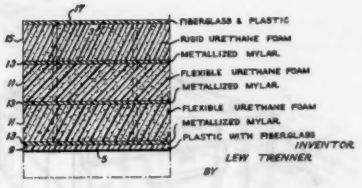
**3,655,086**

## RECEPTACLES FOR THE STORAGE OF LIQUEFIED GASES AT CRYOGENIC TEMPERATURES

**Lew Trenner, Englewood, Colo., assignor to Cryotan, Inc., Canyon, Tex.**

**Filed Oct. 9, 1970, Ser. No. 79,441**
**Int. Cl. B65d 25/18**
**U.S. Cl. 220—9 LG** **9 Claims**

Tanks for the storage of liquefied gases at cryogenic temperatures are disclosed. The disclosed tanks comprise two concentric shells with dished ends. The internal shell is fabricated from layers of glass fabric with organosiloxane treatment. A layer of high tensile wire fabric is incorporated as one of the integral laminae of the internal and external shells. The internal shell is covered with an insulating layer of flexible and rigid urethane foam. This foam is fabricated in contoured or flat blocks of suitable size and shape to con-




form to the inner shell. The blocks may be separated from the inner shell by multiple layers of metallized polyethylene terephthalate (Mylar), or other material which will reflect radiant heat.

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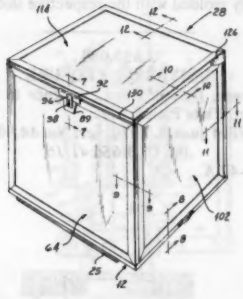
**3,655,087**

## LIGHTWEIGHT KNOCKDOWN CONTAINER

**August G. Luisada, Waymart, Pa., assignor to Gentex Corporation, New York, N.Y.**

**Filed Jan. 29, 1970, Ser. No. 6,855**
**Int. Cl. B65d 7/24, 53/00; B65j 1/02**
**U.S. Cl. 220—1.5** **20 Claims**



A durable lightweight knockdown container in which abutting panels of the container are releasably held in assembled position on a base partially to complete the container for loading. The remaining panel or panels are then simply and expeditiously secured in place to complete the container for shipment. Continuous interengageable connectors along abutting edges of the container panels inhibit bowing or separation of the panel edges under load without external straps while at the same time permitting easy disassembly of the container without the use of tools.

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**3,655,088**

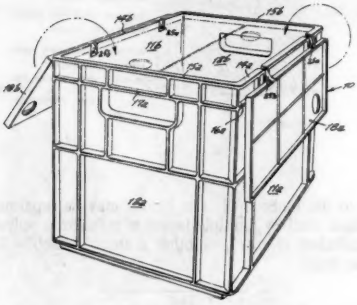
## HIGH-IMPACT PLASTIC CARRYING AND STACKING CASE WITH HINGED COVER

**Theodor Box, 1108 Ailene Road, Brielle, N.J.**

**Filed June 1, 1970, Ser. No. 41,882**
**Int. Cl. B65d 21/02, 51/18**
**U.S. Cl. 220—29** **8 Claims**

An integrally molded high-impact plastic carrying and stacking case, having first and second pairs of opposed verti-

cal walls and a bottom wall, is fitted with a hinged cover comprised of two equal-sized rectangular molded panels spaced from the inner top edges of the vertical walls and occupying the inner space enclosed by said walls in the horizontal and closed position. The panels are provided at their



edges adjoining the vertical walls of one of said pairs and parallel to the inner meeting edges of the panels with pairs of spaced upwardly and angularly outwardly extending lugs projecting into corresponding vertical slots in the top edges of the adjacent vertical walls and connected thereto by hinge joints integrally molded with the respective slots and lugs.

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**3,655,089**

**UNIVERSAL CLOSURE**

**Horace L. Tower, Darien, Conn., assignor to General Foods Corporation, White Plains, N.Y.**

**Filed June 8, 1970, Ser. No. 44,506**

**Int. Cl. B65d *41/16***

**U.S. Cl. 220—42 A** **2 Claims**

A universal closure panel adaptable for use with a variety of different sized drinking glasses, jars, and other small household receptacles to form a liquid-tight seal, particularly when employing the receptacle as a utensil for mixing beverage ingredients by hand-shaking.

**3,655,090**

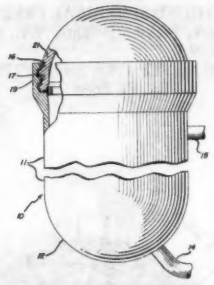
**VESSEL AND CLOSURE WITH INTERLOCKING SHEAR RING JOINT**

**Elmer Weyman Rothrock, Hinsdale, Ill., and Silvio D. Niku, Memphis, Tenn., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.**

**Filed June 25, 1970, Ser. No. 49,837**

**Int. Cl. B65d *41/06***

**U.S. Cl. 220—42 A** **3 Claims**



A vessel with an opening walled thereabout and having a rim projecting forward from a shelf portion on the inside of, and substantially lateral to, the wall, a groove in the shelf portion between the inner surface of the wall and the rim defining a shear ring between the groove and the inner surface wall, and a closure having a peripheral edge which fits inside the vessel rim and a projecting tongue on the inner side of the closure which mates with and fits in the groove in the vessel shelf.

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**3,655,091**

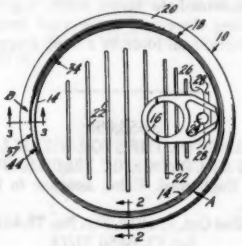
**FULL-OPEN END CLOSURE PROVIDED WITH DISTORTION RESISTANT SHOULDER IN COUNTERSINK WALL**

**Leonard Thomas La Croce, Paramus, N.J., assignor to American Can Company, Greenwich, Conn.**

**Filed Sept. 21, 1970, Ser. No. 73,930**

**Int. Cl. B65d *17/20, 51/20***

**U.S. Cl. 220—54** **5 Claims**




An end closure with a large, removable central panel, an opening tab, a score line about the periphery of the panel and a countersink wall about the periphery of the panel. The

countersink wall is provided with an inwardly stepped shoulder along the major portion of its circumferential distance about the panel, but along the minor portion of the countersink wall, diametrically remote from the tab, no inwardly stepped shoulder is provided, resulting in a construction in the end closure which resists upward distortion, during opening of the closure, of the lower portions of the countersink wall along the minor portion thereof.

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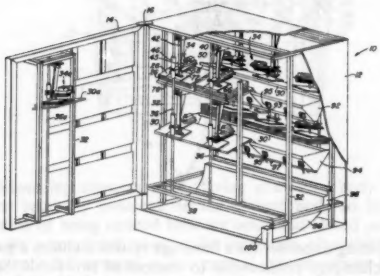
**3,655,092**

## APPARATUS FOR VENDING PERIODICALS HAVING SELF-COMPENSATING DISPENSER FOR DECREASING SUPPLY

Harold G. Hall, and Rufus N. Palmer, both of Mount Lebanon Township, Allegheny County, Pa., assignors to Daniel N. Steiner

Filed Apr. 20, 1970, Ser. No. 29,840
Int. Cl. B65h *1/04*
U.S. Cl. 221—133 21 Claims



A periodical-vending apparatus for vending periodicals successively from the top of a stock of periodicals. It has a housing, a support within said housing upon which a stack of periodicals rests, dispensing means for successively removing individual periodicals from the top of the stack and receiving means opening to the housing exterior for receiving each periodical upon removal from the stack and making it available to the purchaser. The dispensing means or means for removing the periodical from the stack includes a substantially flat plate which rests on top of the stack and has along an edge thereof a flange that extends along and over a side surface of the top periodical. The plate is maintained at a constant, selected pressure against the periodical. A motor is provided for moving the plate in a direction toward the side of said article along which said flange extends to correspondingly move the periodical a distance sufficient to remove it from the stack. A series of vertical troughs are provided for guiding the periodical so removed to the receiving means. To permit vending of a variety of periodicals, the apparatus may comprise a plurality of like vending units disposed vertically and/or in side-by-side relation within the housing.

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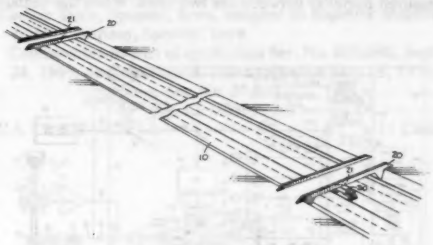
**3,655,093**

## METHOD AND APPARATUS FOR SANDING ROADWAYS

Howard M. Sadwith, 16 Fairway East, Colts Neck, N.J.

Filed Apr. 13, 1970, Ser. No. 27,774
Int. Cl. B67d *3/00*
U.S. Cl. 222—1 3 Claims

This disclosure relates to a method for treating roadways with sand, salt, or other like material generally applied during snow or icing conditions. Preselected overpasses, which extend across the roadway, are provided with storage means for containing predetermined quantities of sand or the like. A truck is driven along the roadway and stopped beneath one of the preselected overpasses. The driver then activates a



dispensing means to cause a quantity of sand to be transferred to the truck. The truck then applies the sand to the roadway until it arrives at another overpass similar to the one described, whereupon it again stops and repeats the process. During intervals between storms, the storage means may be replenished at any time with a new supply of sand or the like.

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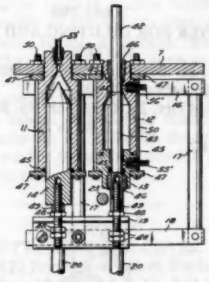
**3,655,094**

## METHOD AND APPARATUS FOR MEASURING AND PROPORTIONING FLUIDS

James C. Hobbs, II, 4384 Ingraham Highway, Miami, Fla.

Filed Dec. 29, 1969, Ser. No. 888,389
Int. Cl. B67d *5/52*; G01f *11/02*
U.S. Cl. 222—1 8 Claims



A semi-automatic, motor operated apparatus for measuring and proportioning liquids including a dual diameter shaft acting as a displacement piston to measure precise amounts of a liquid to be diluted and a diluent.

A method of accurately measuring a liquid sample and a diluent in which a fluid system is vented to the atmosphere after measured amounts of the sample and diluent have been brought into the system and before they are discharged therefrom.

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**3,655,095**

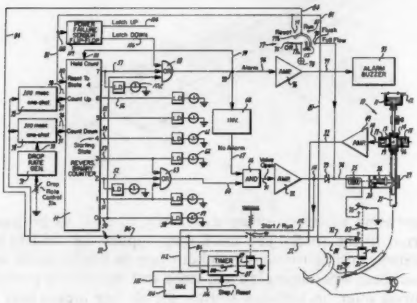
## APPARATUS FOR MONITORING THE DISPENSING OF LIQUID

Martin E. Kienitz, Palo Alto, Calif., assignor to Smith Kline Instruments, Inc., Palo Alto, Calif.

Filed Jan. 17, 1969, Ser. No. 792,030
Int. Cl. A61m *5/16*
U.S. Cl. 222—39 6 Claims

The system delivers a series of drops of liquid and is controlled to release each drop in response to a drop rate

generator set at a selected drop rate desired to be delivered. Each drop actually delivered is detected. By comparing pulses derived respectively from the drop rate generator and from the actual drops delivered, any disparity between the rates will be detected. The disparity detecting means includes means which measures and is tolerant to a limited degree of measured disparity between the two rates. When the disparity between the two rates exceeds a predetermined degree, an alarm condition is established which can include conditioning the delivery means to positively arrest further delivery of drops. The delivery means operates in a manner to automatically compensate for excess drops or reduced drops fed during transient variations in the actual feeding or delivery of drops.



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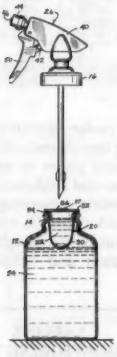
**3,655,096**

## CONTAINER FOR DILUTING AND DISPENSING MATERIAL

**Ross A. Easter, Minneapolis, Minn., assignor to The Pillsbury Company, Minneapolis, Minn.**

**Filed Oct. 22, 1969, Ser. No. 868,443**
**Int. Cl. B67b 7/24**
**U.S. Cl. 222—82** **3 Claims**



A container for diluting and dispensing materials in liquid form that consists of a primary vessel, e.g., a bottle, adapted to contain a diluent such as water and a replaceable cartridge mounted removably in the mouth of the bottle. The cartridge is provided with a laterally projecting circular flange which lies in contact with the edge of the bottle mouth. The cartridge contains a relatively small amount of a chemical concentrate that is to be diluted. A dispensing mechanism composed of a pump with a bottle cap at its lower end is used to withdraw the contents of the container. A dip tube that extends downwards from the cap is introduced into the bottle by thrusting its free end through the cartridge thereby perforating the same and in this way allowing the chemical material in the cartridge to drain into the primary container. The cap is then screwed onto the neck of the bottle. When empty, the cartridges are thrown away and replaced.

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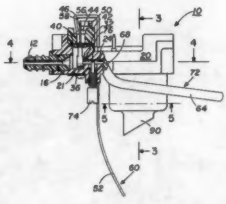
**3,655,097**

## MIXING DISPENSER

**Jack J. Booth, 5006 Tanbark, Dallas, Tex., and William C. Branch, 6730 Greenwich Lane, Dallas, Tex.**

**Continuation of application Ser. No. 742,585, July 5, 1968, now abandoned. This application Sept. 21, 1970, Ser. No. 74,220**
**Int. Cl. F16k 19/00**
**U.S. Cl. 222—129.4** **1 Claim**



A mixing dispenser for a beverage system includes a pair of inlet chambers connectable to sources of two fluids. Selectively operable valves are disposed in each of the inlet chambers to control the flow of the fluids through bores extending from the inlet chambers to a mixing and dispensing chamber. Levers are provided to either simultaneously open the valves in both bores to allow the mixing of the two fluids, or to selectively open either valve to allow the selective dispensing of either of the two fluids.

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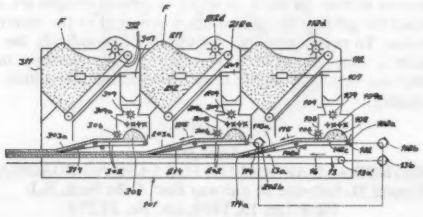
**3,655,098**

## METHOD OF AND AN APPARATUS FOR THE FORMATION OF LAYERS OF COMMINUTED MATERIALS

**Ulrich Schnitzler, Reichenbach, Germany, assignor to Dr. Erwin Schnitzler, Karlsruhe, Bannwaldallee, Germany**

**Filed Oct. 6, 1969, Ser. No. 864,147**
**Claims priority, application Germany, Oct. 5, 1968, P 18 01 533.3**
**Int. Cl. B67d 5/52**
**U.S. Cl. 222—135** **5 Claims**



A method of and an apparatus for the formation of layers of comminuted materials, e.g. sawdust, wood and other cellu-

losic fibers and like materials adapted to be compacted into pressed board, wherein a stationary pile of the loosely comminuted material in a substantially steady state is formed on a movable conveyor surface and/or transferred to such a surface without substantial free fall. The pile may be formed by drawing the comminuted material from a dispenser by an upwardly moving conveyor and passing through a homogenization stage before it is accumulated upon the surface.

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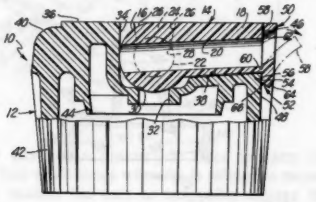
**3,655,099**
**ROTATABLE SPOUT CLOSURES WITH LATCH STRUCTURES**
**Robert E. Hazard, North Kingston, R.I., assignor to Polytop Corporation, Slatersville, R.I.**
**Filed July 27, 1970, Ser. No. 58,263**
**Int. Cl. B67d** *5/32*
**U.S. Cl. 222—153** **12 Claims**



Dispensing closures each having a closure body and a spout rotatably mounted on the closure body so as to be capable of being rotated between open and closed positions can be constructed so as to be incapable of accidental or unintentional opening under normal circumstances by the use of the latch means and a catch means. Either of these means can be located on the body and the other on the spout. These means are constructed so that they will engage one another, preventing undesired spout rotation, upon the spout being assembled in a closed position. By manipulation of the latch means the spout in a closure as described can be rotated from a closed position to an open position once the closure has been assembled with the spout in a closed position.

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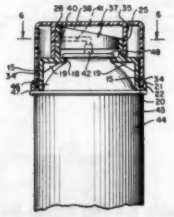
**3,655,100**
**SAFETY COVER CAP FOR AN AEROSOL CONTAINER**
**Isral J. Markowitz, 59 East 42nd Street, Brooklyn, N.Y.**
**Continuation-in-part of application Ser. No. 850,897, Aug. 18, 1969. This application Mar. 13, 1970, Ser. No. 19,228**
**Int. Cl. B65d** *85/14*
**U.S. Cl. 222—182** **4 Claims**



A two-piece cover cap for an aerosol container, wherein the pieces present a unitary appearance, but permit of and require deliberate relative rotation to open and thereby prevent accidental opening by children, and wherein proper directional discharge of the container is effectively assured.

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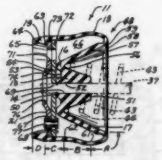
**3,655,101**
**PLUNGER ASSEMBLY FOR HAND GREASE GUNS**
**Chester Dorn, Spencer, Iowa, assignor to Superior Manufacturing Company, Spencer, Iowa**
**Continuation-in-part of application Ser. No. 860,698, Sept. 24, 1969, now abandoned. This application May 15, 1970, Ser. No. 37,831**
**Int. Cl. G01f** *11/00*
**U.S. Cl. 222—326** **11 Claims**



A plunger assembly is provided for slidable engagement with the plunger rod in hand grease guns, which grease guns are adapted to use both cartridge-packed grease and bulk-loaded grease. The plunger, in cross section, is of essentially W-shaped configuration and comprises a sleeve having a bore formed therethrough for slidably receiving the rod. A transverse web is carried by the forward portion of the sleeve and extends radially outwardly and, at its periphery, is attached to an interior support section which extends outwardly and rearwardly of the web to proximate the inside diameter of the grease barrel. An annular flexing and sealing wall is carried by the periphery of the support section and extends outwardly to beyond the inner diameter of the grease barrel and then forwardly and inwardly to a position forward of the sleeve and inward of the inner diameter of a grease cartridge. An annular lip is formed on the inner side of the wall and engages washer means between the lip and the forward portions of the transverse web.

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**3,655,102**
**BOTTLE CAP AND COVER**
**James G. Moran, 122 North Rose Street, Burbank, Calif.**
**Filed Dec. 15, 1969, Ser. No. 884,993**
**Int. Cl. B67d** *3/00*
**U.S. Cl. 222—484** **4 Claims**

A bottle cap and cover for bottles, the cap being internally formed for attachment to a bottle and having a pouring tube and an air inlet tube, both protruding slightly above the end of the cap; the end of the cap having an interrupted rim; the

cover being attached to the cap by a flexible web to permit the cover to be folded over the cap to occupy a predetermined position thereof; the cover having an interrupted internal flange for engaging the interrupted rim of the cap and portions manually engageable to aid in separating the cap from the bottle; the cap also having a pair of stopper cones adapted to be received in the pouring tube and air inlet tube.

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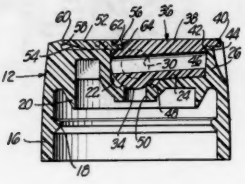
**3,655,103**
**SAFETY DISPENSING CLOSURES**
**Robert E. Hazard, North Kingstown, R.I., assignor to Polytop Corporation, Slatersville, R.I.**
**Filed Apr. 10, 1970, Ser. No. 27,328**
**Int. Cl. B67d** *3/00*
**U.S. Cl. 222—530** **8 Claims**



The invention disclosed pertains to what may be termed "safety dispensing closures," these closures are more difficult to open than known dispensing closures. Such dispensing closures have a closure body and a spout rotatably mounted on the body so as to be capable of being rotated between open and closed positions. In accordance with the invention disclosed a moveable latch means is used with such a known closure so as to extend between the body and the spout when the spout is in a closed position so as to lock or hold the spout in this position. The latch means employed is capable of being moved so as to permit the spout to be rotated to an open position.

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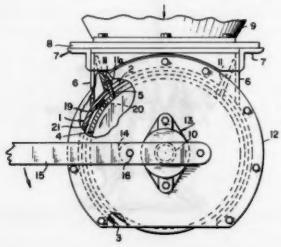
**3,655,104**
**CONSTANT VOLUME DISCHARGE GATE**
**Clarence E. Larson, and Richard H. Dawley, both of Columbus, Ohio, assignors to Martin Masietta Corporation, New York, N.Y.**
**Filed May 6, 1970, Ser. No. 35,219**
**Int. Cl. G01f** *11/24*
**U.S. Cl. 222—317** **6 Claims**



A gate assembly for the measurement and discharge of a fixed volume of flowable material has a rotatable inner drum with an opening therein to receive and discharge material as the drum is rotated between a receiving position and a discharge position. This drum is rotatable mounted within an outer drum attached to the bottom portion of a storage container for the flowable material. The outer drum has an inlet opening on its upper surface and a discharge port on its bottom surface. Sealing means prevent the flow of material down the annulus between the inner and outer drums. A wiper bar is positioned within the annulus to prevent the accumulation of material therein as the inner drum moves between its material-receiving and material-discharge position. Means are provided to prevent the flow of material from the storage container so as to permit the gate assembly to be removed while material is stored in the container.

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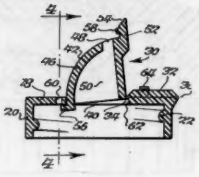
**3,655,105**
**DISPENSING CLOSURE**
**Stanley K. Johns, 588 Linwood Avenue, Buffalo, N.Y.**
**Filed July 14, 1969, Ser. No. 841,492**
**Int. Cl. B67c** *3/00*
**U.S. Cl. 222—484** **8 Claims**



A dispensing closure comprising a closure member, a pouring spout and a strip of material connecting the member and pouring spout and formed integral therewith in a one-piece construction of yieldable resilient plastic material. The strip is provided with hinge portions about which the spout is swung into assembled relation with the closure member, and about which the spout pivots in use. Locking means secure the spout in closed position, and sealing means prevent leakage between the spout and the member.

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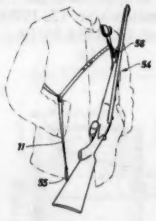
**3,655,106**
**GUNBELT**
**Allan Wojcinski, Tunnlandsgatan, Vastra Frolunda, Sweden**
**Filed Dec. 2, 1969, Ser. No. 870,523**
**Int. Cl. F41c** *33/00*
**U.S. Cl. 224—1 A** **4 Claims**



Rapidly detachable holding device for an implement, particularly a weapon, to be carried, in diagonal position, by means of a sling arrangement, on the upper body, with at least one strap shackle, or the like, to which the holding device is attached, characterized by a preferably plate-shaped part, onto which a locking member made, preferably,

of flexible material, may be slid on, which serves to maintain the part in the inserted position on the strap shackle, and provided with a flange which does not pass through the strap shackle, to which is connected a suspending member which, with the suspending of the implement, serves to engage into a fastening device provided on the sling arrangement.

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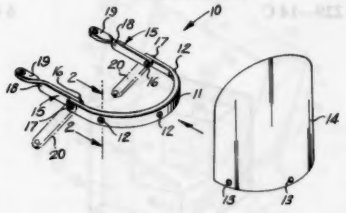
**3,655,107**

## MOTORCYCLE MOUNTED FACE SHIELD HOLDER

**Bobby L. Russ, Route #1, Kelly, N.C., and Morris M. Schmidt, Route #1, Delco, N.C.**

**Filed Dec. 15, 1969, Ser. No. 884,798**
**Int. Cl. B62j** *11/00*
**U.S. Cl. 224—30 A** **1 Claim**



A device enabling a motorcycle rider to carry his face shield with him at all times when he is riding his motorcycle. The device enables the user to snappably engage the face shield to the motorcycle mounting member and includes a U-shaped bar portion to which are attached mounting lugs for attachment to the handlebar mounting portion of the motorcycle.

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## ERRATUM

For Class 224—42 see:
Patent No. 3,655,077

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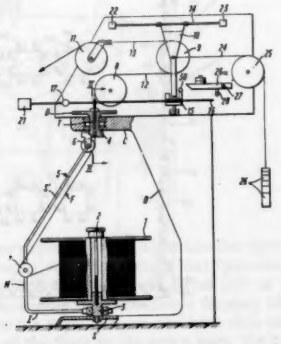
**3,655,108**

## STRAND UNREELING DEVICE WITH AUTOMATIC TENSION CONTROL

**Joannes Francis Marcel Bonnabaud, 23, Rue Noelas 42, Roanne, and Claude Brat, 119 Rue du Marechal Foch 42, Riorges, both of France**

**Filed Nov. 14, 1969, Ser. No. 876,912**
**Claims priority, application France, Nov. 14, 1968, 173652**
**Int. Cl. B65h** *49/00*
**U.S. Cl. 242—128** **7 Claims**



In a device for unreeling a uniformly and automatically tensioned strand from a non-rotatably held bobbin, there are provided an unreeling arm caused to orbit about said bobbin by the force exerted by a strand pulling apparatus, a braking mechanism to dampen the rotation of said unreeling arm and a brake control or balancing mechanism to which there are applied a predetermined braking force and the force exerted by said strand pulling apparatus. The result of these two counteracting forces controls the braking effect on said unreeling arm.

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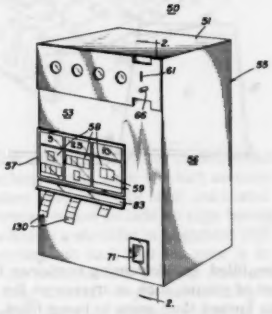
**3,655,109**

## STAMP DISPENSING MACHINE

**Bernard Stevens, Skokie, Ill., assignor to General American Transportation Corporation, Chicago, Ill.**

**Filed July 28, 1969, Ser. No. 845,258**
**Int. Cl. B65h** *25/00*
**U.S. Cl. 226—46** **18 Claims**



A coin-actuated machine including a plurality of dispensing modules dispenses one or more perforated strips of stamps from rolls, each module comprising a feed wheel having rows of evenly spaced projections for engaging the associated strip at the interstamp perforations and moving it past a solenoid-operated cutter, a shaded-pole electric motor for driving the feed wheel in a stepwise fashion through a Geneva cam mechanism and for intermittently operating a stepping switch and counter, a control circuit cooperating with the stepping switch for stopping the machine when a predetermined number of stamps has been dispensed, and a lock engaging the feed wheel either after each intermittent operation thereof or after each dispensing cycle.

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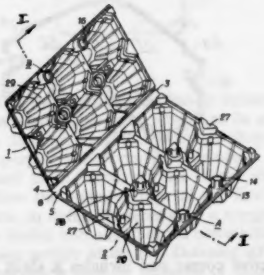
**3,655,110**

## CLOSURE FASTENER FOR HINGED PACKAGES MADE OF DEEP DRAWN PLASTIC FOIL

**Joachim Eisenbach, deceased, late of Klosterneuburg, Austria (by Beatrice Eisenbach, administratrix), assignor to Firma Peter Hinteregger KG, Wiener Neudorf (NO), Austria**

**Filed Mar. 11, 1970, Ser. No. 18,659**
**Int. Cl. B65d** *1/26*
**U.S. Cl. 229—2.5** **3 Claims**



A deep drawn plastic foil package having two mating halves hinged together for closing and provided with in-

tegrally formed closure fasteners is improved by the provision of additional male and female closure fasteners to guide the halves into alignment for engagement of the first-mentioned fasteners.

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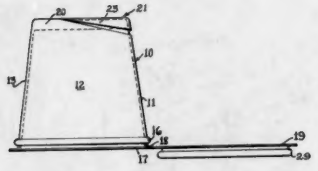
**3,655,111**
**THERMOFORMED PLASTIC CONTAINER**
**Robert A. Surerus, 410 Parkview Drive, Roselle, Ill.**
**Filed Oct. 23, 1970, Ser. No. 83,332**
**Int. Cl. B65d** *1/26, 17/24*
**U.S. Cl. 229—7** **6 Claims**




A bottom-filled, top-dispensing container formed from a single sheet of plastic, such as styrene or the like. The container is so formed that, prior to being filled, it provides an open bottom so that like containers may be vertically stacked one upon the other. The container comprises a hollow substantially square body having an integral top wall, a corner of which provides a pouring spout and a removable cover heat-sealed thereon. The container closure or bottom wall is initially formed as an integral part of the body extending laterally therefrom and being adapted to be folded back upon the container when the latter is filled so as to seal the same.

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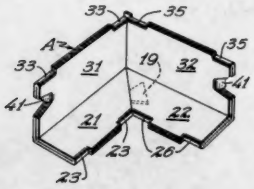
**3,655,112**
**PROTECTIVE CORNER PAD**
**James E. Jeffers, Little Rock, Ark., assignor to Hoerner Waldorf Corporation, Ramsey County, Minn.**
**Filed Oct. 20, 1970, Ser. No. 82,402**
**Int. Cl. B65d** *5/60*
**U.S. Cl. 229—14 C** **11 Claims**




A protective corner pad includes a sheet of corrugated paperboard or the like in which two peripheral wall panels are foldably connected to fold into right angular relation, and are hingedly connected to face panels which may fold into coplanar relation and which are provided with mitered edges which may abut. A locking tongue and notch hold the mitered edges abutting. Reinforcing panels are usually hinged to the edges of said wall panels and folded inwardly into face contact with the wall panels to which they are hinged. Cushioning panels generally coextensive with said face panels are hinged to said face panels to lie in face contact therewith.

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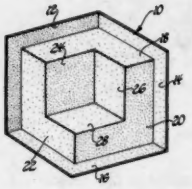
**3,655,113**
**CORNER PROTECTOR**
**Hazen J. Carroll, Farmington, Mich., assignor to Carroll Packaging, Incorporated, Detroit, Mich.**
**Filed June 18, 1970, Ser. No. 47,241**
**Int. Cl. B65d** *5/56*
**U.S. Cl. 229—14 C** **6 Claims**




A corner protector for packing assemblies comprising an injection moided, monolithic plastic sheet formed into an article receiving pocket, three spaced walls and three carton-engaging border walls. The protector is a shell of single sheet thickness but is rigidified when loaded.

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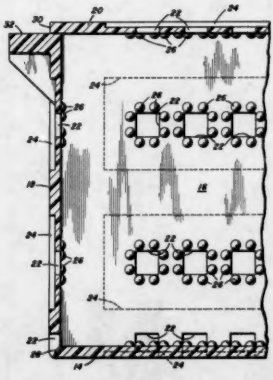
**3,655,114**
**PRODUCE CRATE WITH VENTILATING APERTURED SECTIONS**
**David Turner, Fort Lauderdale, Fla., assignor to Dorothy R. Turner and Cecil G. Brewer, Fort Lauderdale, Fla.**
**Filed Nov. 14, 1969, Ser. No. 876,775**
**Int. Cl. B65d** *5/20, 85/34*
**U.S. Cl. 229—30** **2 Claims**




A crate for fresh produce composed of hinged apertured sections adapted to be folded to form a substantially rectan-

gular receptacle, the inner walls of the sections having arcuate projections for engagement with the produce contents.

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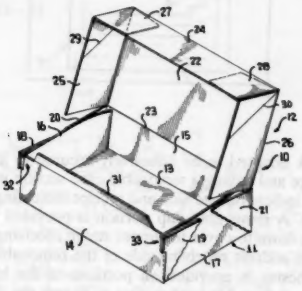
**3,655,115**
**CARTON WITH WEB LOCK**
**Guelfo A. Manizza, Blauvett, N.Y., assignor to Continental Can Company, Inc., New York, N.Y.**
**Filed June 17, 1969, Ser. No. 833,979**
**Int. Cl. B65d** *5/24*
**U.S. Cl. 229—31 R** **13 Claims**



This disclosure relates to foldable cartons wherein adjacent walls thereof are joined together by a folded web. In order that the carton may be retained in an erected condition, there has been provided a web lock which will lock the adjacent corners together in a rigid corner forming relation. The web lock includes a notch or opening in one of the walls adjacent the corner and a projection on the other of the walls extending into the notch and locking the walls against folding relative to one another.

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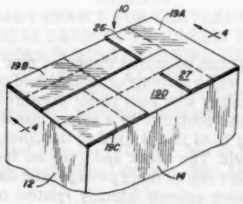
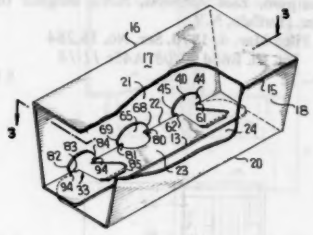
**3,655,116**
**FLAP LOCK CONTAINER**
**Donald M. Tanner, Bellflower, Calif., assignor to Container Corporation of America, Chicago, Ill.**
**Filed Feb. 3, 1970, Ser. No. 8,195**
**Int. Cl. B65d** *5/10*
**U.S. Cl. 229—39** **1 Claim**



A conventional paperboard container has the closure flaps therefore constructed in such a fashion that "pinwheel" closing may readily be achieved. A contiguous pair of the end closure panels extending from the sleeve forming blank are scored parallel to the edges thereof, and have slots extending from the edges of the flaps to the score lines, the two slots and the score lines cooperating upon "pinwheel" closing to facilitate movement of the last to close flaps to closing position.

**3,655,117**
**LATCHING MEANS FOR CARTONS**
**Arthur J. Weiss, Boca Raton, Fla., assignor to Continental Can Company, Inc., New York, N.Y.**
**Filed June 12, 1970, Ser. No. 45,831**
**Int. Cl. B65d** *5/04*
**U.S. Cl. 229—40** **27 Claims**



This disclosure relates to a novel carton which includes cooperative latching means, each of which consists of primary and secondary latching tabs and associated aperture means. The aperture means include an edge having opposite ends between which is a shoulder in alignment with a nose of a secondary latching tab such that the nose is in overlying relationship to the shoulder and prevents inadvertent or accidental unlatching thereof. A primary latching tab is also longitudinally offset from the secondary latching tab and the associated aperture means to effect reinforcement of the carton.

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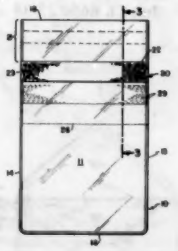
**3,655,118**
**FLEXIBLE MOUTH CONTAINER**
**Franz G. Rinecker, Wayne, N.J., assignor to American Velcro, Inc.**
**Filed June 15, 1970, Ser. No. 46,440**
**Int. Cl. B65d** *33/16*
**U.S. Cl. 229—62** **3 Claims**



A container of the type having a mouth defined by superposed portions of a flexible sheet which can be opened wide and closed by flattening together and convoluting marginal ends of the superposed sheet portions includes a first fastening strip secured to an outside surface of one sheet portion and spaced from the endmost edge of the flexible sheet a length sufficient to define therebetween a marginal portion which may be folded into a plurality of convolutions and the outwardly facing surface of the first fastening strip defines a plurality of upstanding hooking elements of flexible resilient material; a second fastening strip secured to an outside surface of the other sheet portion includes two longitudinal por-

tions the first of which is secured to the flexible sheet and the second of which has an inwardly facing surface defining a plurality of complementary hooking elements of flexible resilient material, the second fastening strip being spaced from the first fastening strip in a direction away from the endmost edge of the flexible sheet.

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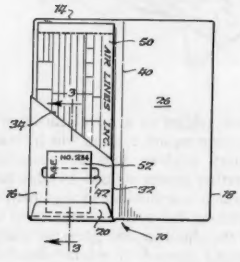
**3,655,119**
**TICKET ENVELOPE**
**Roy G. Thompson, East Amherst, N.Y., assignor to Sale-Niagara, Inc., Buffalo, N.Y.**
**Filed Mar. 4, 1970, Ser. No. 16,284**
**Int. Cl. B65d *27/08*; A45c *11/18***
**U.S. Cl. 229—72** **5 Claims**




A multiple pocket envelope having a front panel, a rear panel folded over the front panel and a bottom flap secured to the front panel to form a first pocket between the panels. Sheet material bonded to the inner face of the rear panel in overlying relation to a slot in the rear panel forms a second pocket within the first pocket.

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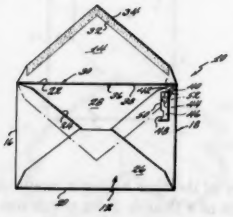
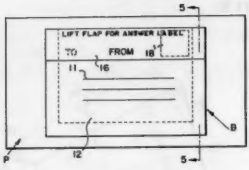
**3,655,120**
**SELF-OPENING ENVELOPE**
**Jason L. Stern, B706 103 G Street, S.W., Washington, D.C.**
**Filed Mar. 20, 1970, Ser. No. 21,456**
**Int. Cl. B65d *27/38***
**U.S. Cl. 229—86** **12 Claims**



A self-opening envelope including a string means secured to the interior surface of the envelope at the fold of the flap and having a tab secured to its free end and positioned under the flap of the envelope. By removing the tab from under the envelope flap, the string can be pulled along the fold of the flap to tear the same and open the envelope.

**3,655,121**
**COMBINATION RETURN ADDRESS AND RECEIPT INDICATING ANSWER CARD DEVICE**
**Alice E. M. Ward, 15 S. Elm Street, Mt. Prospect, Ill.**
**Filed Oct. 14, 1970, Ser. No. 80,650**
**Int. Cl. B65d *27/00***
**U.S. Cl. 229—92.8** **10 Claims**




A blank adapted to be adhesively secured to an envelope or package and having a removable card section with address receiving indicia on one side and receipt indicating indicia on the other. A removable flap portion is provided which may be folded down to cover the upper stamp receiving portion of the return address receiving side of the removable card section. Adhesive is provided on portions of the blank which bound the removable card section to permit the device to be attached return address side up.

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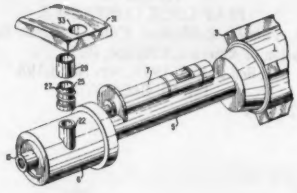
**3,655,122**
**PIPE LINE CLEANER AND SEALER**
**George A. Brown, P.O. Box 777, Casselberry, Fla., and Francis Michael Hinds, 2411 Murphree Road, S.E., Decatur, Ala.**
**Filed Oct. 20, 1970, Ser. No. 82,453**
**Int. Cl. B05b *3/00***
**U.S. Cl. 239—226** **10 Claims**



A device that can be moved through a pipe to treat its interior surfaces with a washing or sealing fluid composition including a container with fluid under pressure and a conduit leading from the container to a rotary nozzle. The conduit terminates in a head that is fixed to the conduit and housed within the nozzle. The nozzle and head are spaced from one another and have one or more passages and ducts respectively, each of which extends laterally relative to the conduit. The passage in the head can be curved so that a turbine structure is formed and exiting fluid creates a force to assist in rotating the nozzle. The nozzle can also be rotated by a motor that is mounted on the conduit and in direct drive with the nozzle. Various rotatable nozzles can be interchanged with one another so that the interior of a pipe can be air cleaned, coated and/or wiped with a wiper blade or otherwise treated with a fluid material. Also, a probe attachment can be placed in communication with a duct of the nozzle to extend a feeler element under pressure and thus assist in detecting plugs and holes in the pipe. A TV camera is normally

attached at the front end of the nozzle for viewing the action of the nozzle and/or probe.

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**3,655,123**

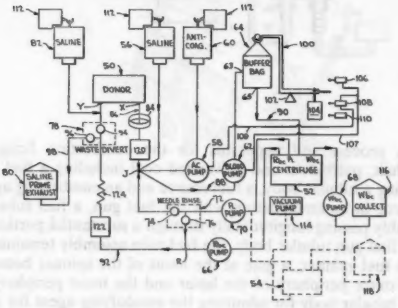
## CONTINUOUS FLOW BLOOD SEPARATOR

**George T. Judson, Whitney Point, N.Y., and Emil J. Freireich, Houston, Tex., assignors to The United States of America as represented by the Secretary, Dept. of Health, Education & Welfare**

**Original application Aug. 8, 1966, Ser. No. 570,792, now Patent No. 3,489,145, dated Jan. 13, 1970. Divided and this application July 30, 1969, Ser. No. 869,418**

**Int. Cl. B04b** *11/00*

**U.S. Cl. 233—21** **9 Claims**




Apparatus for separating whole blood into at least two fractional components and continuously returning at least one component thereof to the source of the blood. The apparatus includes supply means establishing continuous communication between the source and the separating means, the separating means including a high speed centrifuge with a rotating seal means permitting entry of the whole blood through a stationary portion and separation of the blood in the centrifuge with the various components of the blood being returned to the stationary portion of the seal means.

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**3,655,124**

## AUXILIARY DEVICE FOR CENTERING OF THE CENTRIFUGAL DRUM OF PENDULUM TYPE HYDRO EXTRACTORS DURING CLEARING WITH A HIGH NUMBER OF REVOLUTIONS

**Harald Sommer, Braunschweig, Germany, assignor to Braunschweigische Maschinenbauanstalt, Braunschweig, Germany**

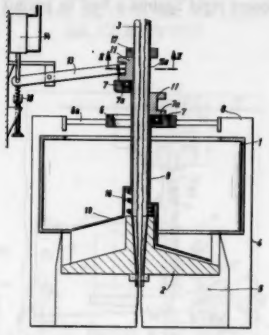
**Filed Apr. 15, 1970, Ser. No. 28,871**

**Claims priority, application Germany, Apr. 16, 1969, P 19 19 223.5**

**Int. Cl. B01d** *21/26*

**U.S. Cl. 233—46** **3 Claims**

An auxiliary device for centering of the centrifuge drum of pendulum centrifuges during clearing at a high number of revolutions which comprises a bearing guiding a centrifuge drum during clearing and rigidly supported at least timely temporary against radial deviation. The drum shaft has an axially displaceable sleeve within the range of the upper edge of the drum. The bearing comprises a friction-free designed rotary bearing carried by the sleeve. A protecting jacket surrounding the rotary bearing. A centrifuge housing, and a centering ring is disposed coaxially rigidly secured to the drum shaft on the centrifuge housing within the range of the upper



edge of the drum shaft, and the sleeve is rollable-in and -out with the bearing and the protecting jacket.

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**3,655,125**

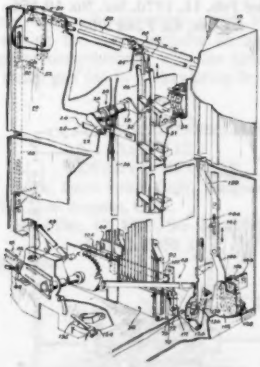
## VOTING MACHINE

**Alexander N. Ditonto, Jamestown, and Charles J. Lindros, Lakewood, both of N.Y., assignors to AVM Corporation, Jamestown, N.Y.**

**Filed Aug. 3, 1970, Ser. No. 60,304**

**Int. Cl. G07c** *13/00*

**U.S. Cl. 235—54 R** **11 Claims**



A voting machine having an arrangement for preventing the so-called "Single Shot" ballot, which includes an auxiliary interlock and an electrical control circuit responsive to the condition of the auxiliary interlock for locking the machine operating lever against vote registering movement until a "Single Shot" voting error is corrected by the voter.

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**3,655,126**

## MOTION TRANSFER MECHANISM

**Frank Anthony Digilio, Medfield, Mass., assignor to RCA Corporation**

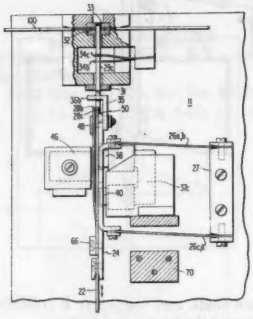
**Filed Dec. 30, 1969, Ser. No. 889,239**

**Int. Cl. G06k** *1/05*

**U.S. Cl. 234—115** **7 Claims**

A motion transfer mechanism suitable for use in a data card punch. A flexible interposer has a free end, which may

naturally occupy one of two positions, one in line with a punch die and the other out of line with the punch or die. A selectively operable electromagnet causes the flexible interposer to become rigid against a bail to permit punching. A



second magnet attracts the interposer away from the bail when punching is not desired. To reduce friction between the interposer and the elements associated therewith, all are coupled to and move with the bail.

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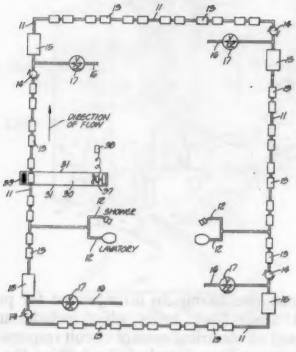
**3,655,127**

## HEATING SYSTEM

**James R. Piper, 6405 West Chartres Drive, Palos Verdes, Calif.**

**Filed Feb. 11, 1970, Ser. No. 10,456**
**Int. Cl. F24d *3/08***
**U.S. Cl. 237—8** **14 Claims**



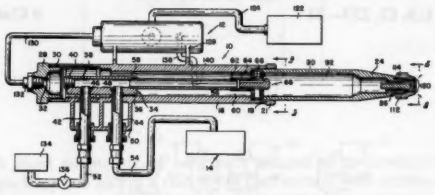

A series-loop heating system provides heat for a plurality of controlled temperature zones within a large building or several buildings and utilizes and incorporates within the system both the domestic hot water system and the standard structural members normally associated with such a building or buildings. The heating system includes a normally closed circuit with a plurality of heat exchange coils connected to the circuit in series through which the domestic hot water is continually circulated. Each controlled temperature zone includes at least one heat exchange unit and each heat exchange unit includes one of the heat exchange coils over which air is passed when heating the zone.

**3,655,128**

## PROCESS AND APPARATUS FOR THE COMBUSTION FIRING OF ASPHALT, PETROLEUM AND PULVERIZED COAL

**Albert W. De Voe, R. F. D. 4, Portland, Maine**

**Original application July 25, 1968, Ser. No. 747,698, now Patent No. 3,556,408. Divided and this application June 8, 1970, Ser. No. 44,076**
**Int. Cl. F23c *11/00***
**U.S. Cl. 239—8** **8 Claims**



A process and apparatus for the combustion firing of asphalt, petroleum and pulverized coal including a fuel gun having a tubular body, a fuel source and an emulsifying agent source in communication with the fuel gun, a fuel tube assembly passing longitudinally through a substantial portion of the fuel gun tubular body, the fuel tube assembly terminating in a fuel spinner, a gate at the locus of the spinner between the outer periphery of the latter and the inner periphery of the tubular body for admitting the emulsifying agent for mixing with the fuel in an emulsifying chamber after it passes through the fuel spinner, thereby forming an emulsion slurry, the slurry then being fed through a second spinner to a spin shamber prior to discharge from the gun for firing.

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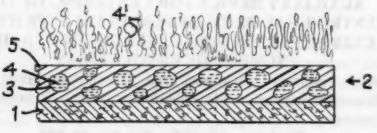
**3,655,129**

## SLOW RELEASE FILMS AND METHODS OF MAKING SAME

**Jerome A. Seiner, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed July 17, 1968, Ser. No. 745,433**
**Int. Cl. A24f *25/00*; A61l *9/64***
**U.S. Cl. 239—60** **11 Claims**

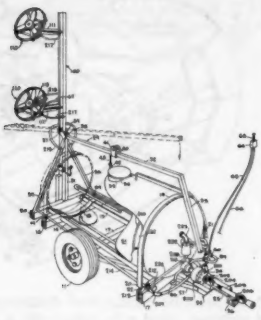



Disclosed herein are various coatable films which have entrapped within their polymeric matrix minute droplets of a liquid non-solvent. The polymeric matrix and non-solvent are chosen such that there is effected about the film a controlled release of the non-solvent from the film. Utility lies in choosing the non-solvent so that it comprises substances such as perfumes, deodorants, air fresheners, medicines, pesticides, corrosion inhibitors, fungicides, etc. The atmospheres generated are thus used to supply the various substances to a needy environment.

## 3,655,130
## SPRAYING SYSTEM

Keith H. Patrick, Montgomery, Ala., assignor to Ring Around Products, Inc.

Continuation-in-part of application Ser. No. 686,425, Nov. 28, 1967, now Patent No. 3,552,650. This application June 4, 1970, Ser. No. 43,352
Int. Cl. B05b *3/12*
U.S. Cl. 239—77 23 Claims

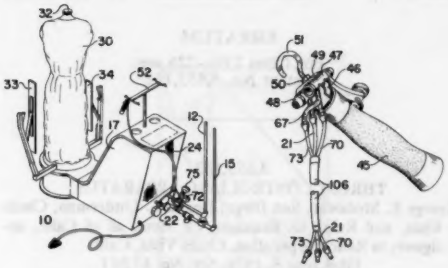


This invention relates to an improved spraying system for spraying fluid chemicals. The improved spraying system includes a supply means for containing a supply of fluid chemicals and a series of spraying heads for spraying chemicals on foliage or a crop to be sprayed. Each of the spraying heads includes an annular diffusion member and a rotatable impeller means for developing a uniform blast of directed air pressure over the outer surface of the diffusion member. A dispensing nozzle is operatively associated with each of the spraying heads for dispensing a quantity of fluid chemicals into the diffusion member to be directed by centrifugal force out through the diffusion member into the blast of air. The dispensing nozzles are coaxially mounted and extend through the rotatably driven impeller means. A supply pump is operatively associated with the supply means and the dispensing nozzles for delivering a supply of fluid chemicals under pressure to the dispensing nozzles. A hydraulically driven motor means is operatively associated with each of the spraying heads and includes a driving gear coaxially mounted relative to the dispensing nozzle, the diffusion member and the rotatable impeller means. A hydraulic pump means is operatively associated with the motor means for delivering hydraulic fluid under pressure for operation of the motor means. The improved spraying system is designed for being utilized on a plurality of supporting vehicle frameworks. One of the supporting vehicles includes a trailer having a movably mounted boom for supporting a series of the spraying heads for movement in a vertical plane between operative and inoperative positions. A second supporting means includes a framework having connectable members which will permit the framework to be connected to conventional three point hitch provided on a supporting vehicle. A third type of supporting framework includes a transverse mast having a pair of laterally extending booms which are adapted to be swung about vertical axis from laterally extending positions to fore and aft positions. Each of the laterally extending booms is detailed for supporting at least one spraying head.

## 3,655,131
## ASSEMBLY OF FLUID SPRAYING GUNS

Frank H. Richterkessing, Louisville, Ky., assignor to The Cissell W. M. Manufacturing Company, Louisville, Ky.

Filed Feb. 24, 1970, Ser. No. 13,455
Int. Cl. B05b *9/00*
U.S. Cl. 239—124 3 Claims

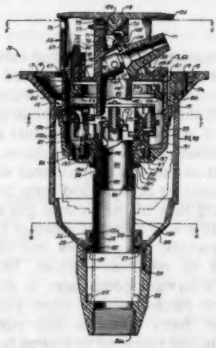



A garment finisher having steam supply and steam return conduits serving the same includes an assembly of fluid spraying guns communicating with the steam conduits. An improved steam gun fed by a circulating dry steam source is disclosed.

## 3,655,132
## ROTARY SPRINKLER

Richard F. Rosic, Dana Point, Calif., assignor to The Leisure Group, Inc., Los Angeles, Calif.

Filed Dec. 17, 1969, Ser. No. 885,756
Int. Cl. B05b *3/04*
U.S. Cl. 239—206 19 Claims



A rotary sprinkler having a low-impedance conduit for conveying water to one or more nozzles with minimum loss

of energy. A water-motor impeller is positioned outside the conduit and is driven by water bled from the main conduit stream and directed through a reversing jet assembly. One nozzle of the sprinkler has a venturi portion connected through a suction tube to a chamber downstream of the impeller. Water from the downstream side of the motor is aspirated through the suction tube and ejected through the nozzle. The sprinkler is adjustable to rotate continuously, or to cover a selected sector. Nozzles are mounted on interchangeable blocks to permit simple adjustment of the sprinkling pattern. In one form, the sprinkler is a pop-up type arranged to flush dirt and sand from the sprinkler interior each time it is activated.

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**ERRATUM**

For Class 239—226 see:
Patent No. 3,655,122

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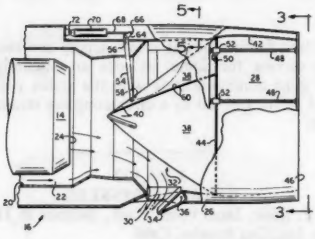
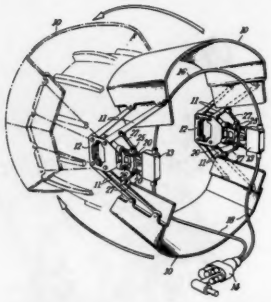
**3,655,133**
**THRUST CONTROLLING APPARATUS**
**George E. Medawar, San Diego; Duane L. Linderman, Chula Vista, and Ralph O. Brannon, La Mesa, all of Calif., assignors to Rohr Corporation, Chula Vista, Calif.**
**Filed June 5, 1970, Ser. No. 43,861**
**Int. Cl. B64c *15/06***
**U.S. Cl. 239—265.31** **8 Claims**



Apparatus comprises elongate shroud surrounding jet engine. Aft portion of shroud extends rearward beyond exit end of jet nozzle to surround and control exhaust gas stream. Passages through shroud wall aft of nozzle exit provide flow paths for entry of ambient air to constitute a thrust reverser or thrust modulation system. Blocker doors, generally triangular in planform, are stowed against inner wall of aft portion and deploy to converge forward and form cone shaped body blocking rearward flow of the exhaust gas stream. Apex of the blocker doors is well ahead of passages to divert gas outwardly and rearwardly to passages and through them to produce reverse or modulated thrust. External deflector doors produce a forward component in exiting stream, or scoop in air for ejector action when blocker doors are stowed. Blocker doors translate and rotate forward to deployed position and rearward to stowed position out of registry with deflectors doors. Latter are movable differentially independently of blocker doors to modify pitching moment contribution. Apparatus may be used with conventional jet or fan jet engines.

**3,655,134**
**JET ENGINES FOR AIRCRAFT**
**Leonard Sidney Greenland; Charles Philip Smith, and David Marshall, all of Wolverhampton, England, assignors to H. M. Hobson Limited, London, England**
**Filed Nov. 23, 1970, Ser. No. 91,859**
**Int. Cl. B64c *15/06***
**U.S. Cl. 239—265.37** **12 Claims**



A thrust reversal system for an aircraft jet engine comprising a pair of thrust reverser buckets movable between a stowed and a deployed position, an air motor operable under pilot's control for imparting movement to the buckets and mechanism for automatically decelerating the air motor as the buckets approach both the stowed and the deployed positions.

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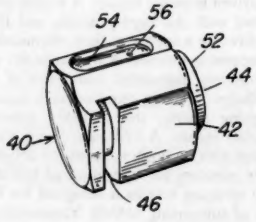
**3,655,135**
**STEAM OUTLET HEAD WITH A DISPENSER FOR A FRAGRANCE OR MEDICANT**
**Murray Altman, Scarsdale; David Altman, Bronx, and Seymour E. Altman, Queen's Village, all of N.Y., assignors to Thermasol, Ltd.**
**Filed June 29, 1970, Ser. No. 50,511**
**Int. Cl. A62c *5/02*; B05b *7/26***
**U.S. Cl. 239—310** **8 Claims**

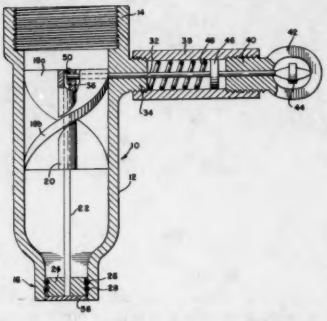



A steam outlet head is disclosed having inlet and outlet ports and a connecting interior channel for passage of steam through the head. A reservoir for a fragrance or medicant is positioned on top of the head and an orifice connects the reservoir with the channel to mix the fragrance or medicant with the steam passing through the head. The orifice is sized and positioned such that the flow of fragrance or medicant is effected substantially by the flow of steam through the head.

## 3,655,136
## PRESSURE RESPONSIVE FLUID NOZZLE

William L. Livington, Sharon, Mass., assignor to Factory Mutual Research Corporation, Norwood, Mass.

Filed Dec. 30, 1970, Ser. No. 102,652
Int. Cl. B05b *1/32*
U.S. Cl. 239—452 10 Claims

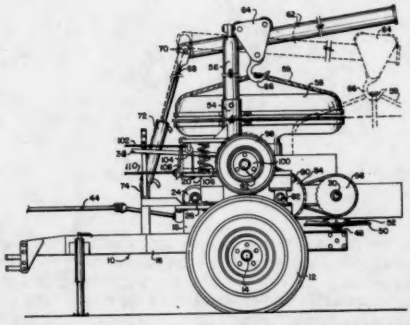


A pressure responsive fluid nozzle wherein an expellable plug is disposed in the outlet of a body member having an inlet adapted for connection to a source of fluid under pressure. The plug is connected relative to the body member by means of a connector which is placed under tension in response to the fluid pressure in the body member. Upon the fluid pressure attaining a predetermined magnitude, the connector is adapted to break to release the plug from the outlet and permit the fluid to be discharged from the nozzle.

## 3,655,137
## MOBILE, CONTAINERIZED DISPENSER FOR FLOWABLE MATERIALS

James W. Lang, 4523 Jennings, Wichita Falls, Tex.

Filed Feb. 2, 1970, Ser. No. 7,953
Int. Cl. A01c *19/00*
U.S. Cl. 239—670 13 Claims

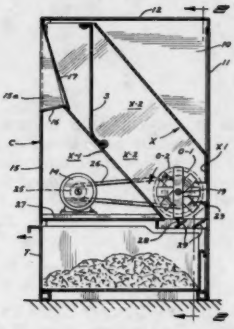


A mobile dispensing mechanism which utilizes a detachable container, which container is moved into place and attached to the dispensing mechanism, thereby avoiding the necessity of unloading the material into a bin or hopper. The flowable material is directed therefrom onto a conveyor and onto a spreader disc for discharge of the flowable material over a wide area, as the mobile unit is moved over the terrain. Provision is made for controlling the rate of flow of the material being dispensed onto the rotating disc. Further provision is made to move the filled container onto the mobile unit and for directing the container from the mobile unit when the material has been depleted.

## 3,655,138
## MACHINE FOR COMMINUTING GLASSWARE AND THE LIKE

Gene A. Luscombe, Route #1, Dolliver, Iowa

Filed Aug. 8, 1969, Ser. No. 848,617
Int. Cl. B02c *19/12, 13/02*
U.S. Cl. 241—99 3 Claims



A machine for comminuting glassware or the like into small, rather uniform particles, which employs an upstanding disintegration chamber having an entrance in the upper portion for receiving the material to be comminuted. Within the lower portion of the chamber and extending transversely thereof is mounted a high speed rotary comminutor mechanism which comprises a plurality of sets of rigid comminuting elements or bars disposed radially and sequentially on a common axis of revolution. The elements of each set extend in axially spaced relation and are successively angled differentially. Adjacent elements of each set preferably are of somewhat different lengths so that their disintegrating tips or extremities lie in different orbits of revolution. The said rotary comminuting mechanism per se disintegrates the bottles, containers, glassware or stiff plastic without the use of stationary grate bars or other shearing elements, and the disintegrated particles with preferably the assistance of a deflection medium are dropped by gravity and collected in a drawer or other collection medium which is readily removable from the machine for periodic dumping of the collected particles. With my improved structure, material such as frangible bottles and other containers may be comminuted into particles of average size of less than one half inch in longest dimensions.

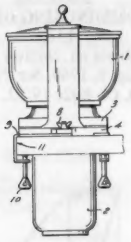
## 3,655,139
## PORTABLE APPLIANCES

Fritz Otto, Hameln, Germany, assignor to Belder Trust, Reg., Vaduz, Liechtenstein

Continuation-in-part of application Ser. No. 292,334, July 2, 1963, now Patent No. 3,240,435. This application Nov. 24, 1965, Ser. No. 509,579. The portion of the term of this patent subsequent to July 2, 1980, has been disclaimed.
Claims priority, application Germany, July 2, 1962, St 14,859
Int. Cl. B24b *41/00*
U.S. Cl. 241—101 11 Claims

A mounting assembly for mounting a portable machine on a support member having a top face and two spaced edge

portions in such a way that the machine is positioned laterally of the support member, comprises an elongated supporting arm which is adapted to be placed on the top face of the support member. One end portion of the supporting arm can be fixed to the machine and an opposite end portion is located remote from the machine with an intermediate portion between the end portions. A first fastening means is connected to the intermediate portion and can be releasably fastened to one edge portion of the support member, and an elongated second fastening means is connected at one end to the opposite end portion of the supporting arm and can be fastened with its other end to the other of the edge portions of the support member.



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**3,655,140**

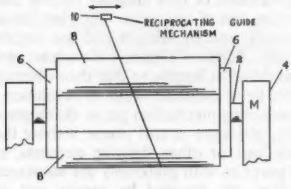
**MACHINE FOR WINDING FLEXIBLE MATERIAL**

**William F. Gordon, Yonkers, and James W. Newman, Scarsdale, both of N.Y., assignors to Windings, Inc.**

**Original application Feb. 29, 1968, Ser. No. 709,305, now abandoned. Divided and this application Mar. 2, 1970, Ser. No. 18,780**

**Int. Cl. B65h** *54/00, 75/02*

**U.S. Cl. 242—18 R** **2 Claims**




A package of flexible, particularly springy material, is produced by a winding in the nature of a universal wind on a spindle having spaced curved ends and a cross section of oblong shape, a radial hole being built into the package substantially at the center of one of the sides of the oblong, and the flexible material being fed out from the interior of the package through this hole by means of a payout tube inserted in the hole and extending into the open central interior of the package where it flares outwardly. The completed package is thicker in the elongated sides than in the substantially semicylindrical end portions because the crossovers in the end portions are spaced further apart than in the side portions. Thus when one or both of the side walls are flattened, as by insertion in a package, the flattened side wall portions bulge inwardly so that the interior axial space within the package is substantially in the space of a dumb-bell or kidney with the interior walls closer together at the center than at the sides. A removable part inserted and held in the payout tube has a member engaging the opposite interior wall to stabilize the package during shipment and handling.

**3,655,141**

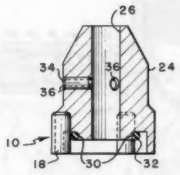
**BOBBIN ADAPTOR**

**William P. Warthen, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.**

**Filed Sept. 21, 1970, Ser. No. 73,753**

**Int. Cl. B65h** *54/54*

**U.S. Cl. 242—46.4** **1 Claim**




An adaptor for a bobbin or the like which is used on apparatus for twisting strands of textile or other fibers and will fit over a standard size spindle to provide a support for a bobbin having a diameter larger than the standard size spindle. The adaptor employs a resilient member which exerts a force on a plurality of dowels to press them against the inside walls of a bobbin or spool placed thereover.

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**3,655,142**

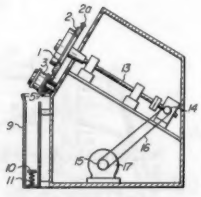
**SPIRALLY WOUND WEB PAY-OUT APPARATUS**

**Takehisa Mase; Hirosi Kawaura, both of Kariya; Terumoto Yamaguchi, and Yosinao Amano, both of Anjo, all of Japan, assignors to Nippondense Kabushiki Kaisha, Kariyashi, Aichi-ken, Japan**

**Filed Apr. 8, 1970, Ser. No. 26,667**

**Int. Cl. B65h** *75/30*

**U.S. Cl. 242—55** **2 Claims**



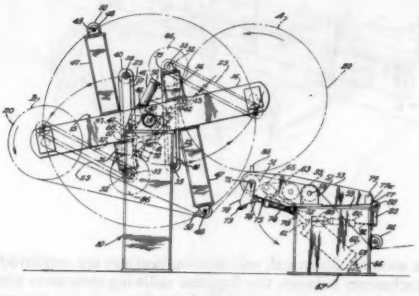

A spirally wound web pay-out apparatus for paying out a web of thin gauge wound in convolutions comprising a reel for mounting the web in coil form, reel drive means and a pair of rotatable feed rollers, one of the pair of feed rollers being a fixed roller having a fixed axial position and the other feed roller being a movable roller adapted to be urged by a spring to bear against the fixed feed roller. Gear teeth are formed on the outer circumferential surface of one coaxial side plate of the reel and a gear is attached to each of the pair of feed rollers coaxially with the respective rollers with the gear of the fixed feed roller being maintained in meshing engagement with the gear teeth of the reel and the gear of the movable feed roller.

3,655,143

## TURRET MOUNTED FLYING SPLICE UNWIND

Robert L. Wallis, West Chester, Pa., assignor to Dowington Division Beloit Corporation, Downingtown, Pa.

Filed Mar. 2, 1970, Ser. No. 15,336
Int. Cl. B65h *19/16*
U.S. Cl. 242—58.3 5 Claims



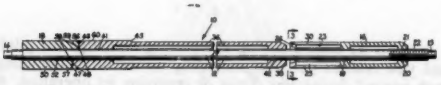
Unwinder for rolls of paper having individual tape drives engaging the peripheries of the rolls for unwinding the rolls at a uniform linear velocity. The rolls are carried at opposite ends of a turret mounted for adjustable movement about a horizontal axis and moved into its selected position of adjustment by power. The turret support sets of diametrically opposed core shaft chucks for core shafts carrying the rolls of paper. As one roll of paper is being unwound the turret is moved into position to pick up a new roll. The new roll is then positioned in the position formerly occupied by the expiring roll. As the expiring roll is unwound to within a few inches, a knife on a splice arm is activated to shear the end of the expiring roll. A roll on the splice arm is then moved to engage the end of the expiring roll with the new roll and splice the end of the expiring roll to the new roll and carry the new roll to the sheet run.

3,655,144

## PAPER ROLL SHAFT WITH EXPANDABLE COLLAR

Frank A. Turner, Lake Oswego, Oreg., assignor to Publishers Paper Co., Oregon City, Oreg.

Filed May 18, 1970, Ser. No. 38,154
Int. Cl. B65h *17/02, 75/02*
U.S. Cl. 242—68 5 Claims



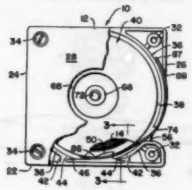
A material winding shaft having a split sleeve at one end adapted to form, when expanded, a collar for retaining material roll cores on the shaft. A shell is slidably retained on the shaft with a beveled shoulder formed thereon for engaging and expanding the split sleeve. Axial displacement between the sleeve and the shell is produced by rotation of a control handle, secured at the other end of the shaft, effecting movement of interengaging cam surfaces on the inner end of the handle and the end of the shell adjacent thereto.

3,655,145

## CARTRIDGE, CASE AND WEB

Alf J. Olsen, Elk Grove Village, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Dec. 2, 1969, Ser. No. 881,344
Int. Cl. G03b *1/04*; G11b *15/32, 23/04*
U.S. Cl. 242—197 14 Claims



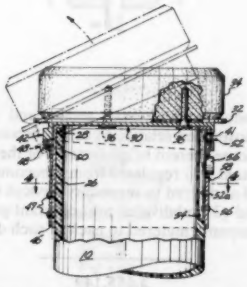
A leader on a web coacts with a hook which projects into a reel chamber in a case to limit web recoil into, and interfere with initiation of web removal from, the case. The leader also coacts with a reel on which the web is wound to prevent web ravel. The leader has an aperture and is fashioned with a pair of sloping shoulders which are wider than the spacing of the reel flanges such that upon web recoil the shoulders engage the flanges causing the leader to bend and displace the aperture toward engagement with the hook and to tension the reel to cause its frictional retention.

3,655,146

## PNEUMATIC DISPATCH SYSTEMS

Toni Woll, 12912 N.E. 30th Street, Bellevue, Wash.

Filed Apr. 13, 1970, Ser. No. 27,617
Int. Cl. B65g *51/06*
U.S. Cl. 243—35 1 Claim



The forward of leading end of a sliding carrier has an open-mouth for the insertion and removal of articles carried. A closure for said mouth mounts the riding head.

**ERRATUM**

For Class 243—35 see:
Patent No. 3,655,153

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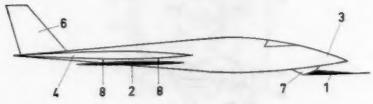
**3,655,147**
**DEVICE FOR REDUCING THE SUPERSONIC BOOM CAUSED BY AIRCRAFT**

**Heinz Preuss, Gothaer Strasse 54, 3 Hannover, Germany**

**Filed Apr. 25, 1968, Ser. No. 724,059**
**Claims priority, application Germany, Apr. 26, 1967, P 42 011**
**Int. Cl. B64c** *23/04*
**U.S. Cl. 244—1 N** **3 Claims**




The invention describes means for reducing the supersonic boom caused by aircraft. Underneath the aircraft reflecting surfaces are provided in the area of the maximum pressure difference of the Mach cone created by the aircraft.

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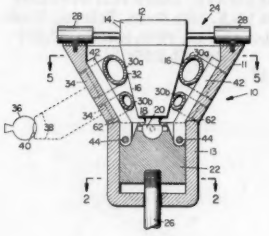
**3,655,148**
**CONTROL MECHANISM**

**Edward E. McCullough, Brigham City, Utah, assignor to Thiokol Chemical Corporation, Bristol, Pa.**

**Filed June 20, 1969, Ser. No. 839,780**
**Int. Cl. F41g** *7/00*
**U.S. Cl. 244—3.22** **7 Claims**




A cam body, movable both axially and laterally, is so shaped and positioned relative to cam followers that the total possible response thereof to movements of the cam body may be at any instant, (1) regulated from a maximum to zero, (2) proportioned as desired to secondary devices operated by the followers, and (3) subdivided into constant-proportion components of response metered to each of such devices.

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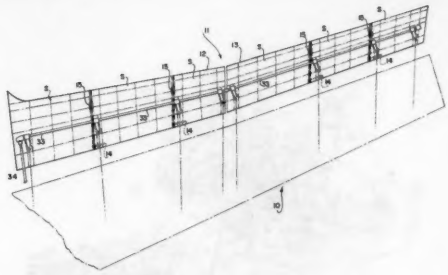
**3,655,149**
**FLAP ACTUATING MECHANISM**

**William W. Williams, Atlanta, Ga., assignor to Lockheed Aircraft Corporation, Burbank, Calif.**

**Filed Sept. 25, 1970, Ser. No. 75,609**
**Int. Cl. B64c** *9/18*
**U.S. Cl. 244—42 DA** **6 Claims**

An extensible and retractable wing flap actuating mechanism particularly designed and adapted for modern heavy cargo aircraft employs gear-driven sliding rails to support and extend the flap and separate gearbox and linkage arrangements buried inside the flap to control the angle thereof. Thus, conventional tracks, rollers, screwjacks and similar relatively complex, heavy and unreliable mechanisms




are avoided. Spherical, self-aligning bearings are employed as attachments between the flap and rail/wing structures which allow the conjugate motions of the flap and the structural deflections to occur without binding or jamming the mechanism.

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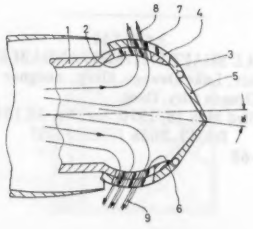
**3,655,150**
**AIRCRAFT JET ENGINE WITH VECTORING NOZZLE FOR CONTROL PURPOSES**

**Erich J. Haberkorn, Riemerling, and Klaus Englaender, Munich, both of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Munich, Germany**

**Filed June 17, 1970, Ser. No. 47,008**
**Claims priority, application Germany, June 23, 1969, P 19 31 747.6**
**Int. Cl. B64d** *33/04*
**U.S. Cl. 244—53 R** **6 Claims**



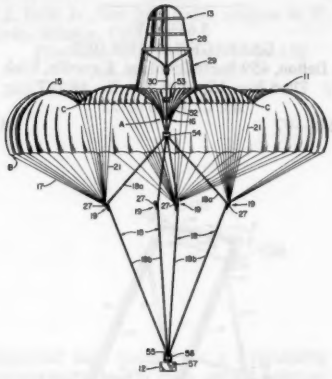

Aircraft jet engine having a vectoring discharge for pitch and yaw control purposes including means for maintaining such control during low thrust or reversing jet operation. A vectoring nozzle is arranged on the exit of the jet tube in the manner of a ball joint for universal swiveling and the lateral and vertical control obtained thereby. Openings are provided for both the inner and outer portion of the cooperating spherical members such that when the vectoring nozzle swivels on the jet pipe more or less of the openings on the respective sides thereof come into register with each other. By directing the discharge from said openings in a reversing direction, same will function as reversing jets when the nozzle is closed and by swiveling thereof such discharge can be directed to one side or the other of the aircraft to obtain the desired directional control.

3,655,151

## REREEFING PARACHUTE AND AERIAL RECOVERY SYSTEM

Otis B. Ferguson, Alamogordo, N. Mex., assignor to Recovery Systems Research, Inc., Alamogordo, N. Mex.

Filed Dec. 29, 1969, Ser. No. 888,453
Int. Cl. B64d 17/02
U.S. Cl. 244—142 13 Claims



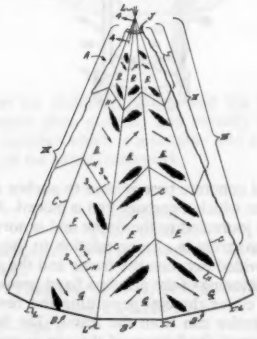
A parachute for use as the main load-bearing device in a mid-air recovery system is provided with canopy rigging including intermediate load-bearing suspension lines connected at spaced points of attachment between an intermediate portion of the canopy and an attaching juncture of one of several groups of skirt suspension lines and an intermediate portion of one of several control lines disposed between a central portion of the canopy and the payload to provide a flattened canopy profile. An inflatable extension mounts on top of the parachute and together with a canopy-like cap portion which covers the top of the extension forms a lightweight balloon-like body or skin which confines a volume of air above the main parachute to support an engagement harness thereon. The inflatable body may be illuminated for night or inclement weather pick-ups and is capable of sustaining a target package such as a radio transmitter or the like.

3,655,152

## STRETCH FABRIC PARACHUTE CANOPY

Clifford Bonn, Buffalo, N.Y., and Kenneth R. A. Wilson, Redondo Beach, Calif., assignors to Irvin Air Chute, Limited, Fort Erie, Ontario, Canada

Filed Mar. 17, 1970, Ser. No. 20,254
Int. Cl. B64d 17/12
U.S. Cl. 244—145 8 Claims



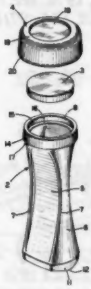
A stretch fabric parachute canopy having relatively low air permeability in low speed escape and a relatively high air permeability in high speed escape.

3,655,153

## PNEUMATIC SYSTEM CARRIER CONSTRUCTION

William H. Terrell, Akron, Ohio, assignor to Diebold, Incorporated, Canton, Ohio

Filed July 10, 1970, Ser. No. 53,786
Int. Cl. B65g 51/06
U.S. Cl. 243—35 5 Claims



An open end carrier construction for conveying folded paper or paper-like slips between terminal stations in pneumatic tube systems. A hollow carrier body is formed with open ends, one end of which is closed by a disc and cap. The carrier body is double-concave and forms a narrow inner passage or slot intermediate the carrier ends through which folded slips extend and in which the slips are securely gripped when inserted in the carrier body through the uncapped end.

3,655,154

## DEVICE FOR FIXING EQUIPMENT, SUCH AS ELECTRICAL APPARATUS, ON A SUPPORT

Joseph Orts, Stains, France, assignor to La Telemecanique Electrique, Nanterra, Hauts-de-Seine, France

Filed Mar. 3, 1970, Ser. No. 16,041
Claims priority, application France, Mar. 4, 1969, 69/05928
Int. Cl. G12b 9/08
U.S. Cl. 248—27 4 Claims

Improved device for fixing equipment, in particular electrical apparatus, on supports such as switchboards of the kind

in which the apparatus comprises a threaded socket passing through an orifice formed in the switchboard and held by means of a knurled knob supported against the front face of said switchboard with no need to take into consideration the thickness of the switchboard because the screwing down of the knurled knob causes the rotation of the socket and the upward movement of a clamping ring against the internal face of the switchboard until the final fixing is obtained.

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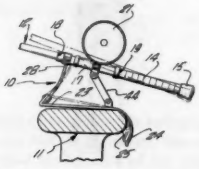
**3,655,155**
**FISHING ROD MOUNT**
**John R. Taylor, 9503 Rivera Road, Pico-Rivera, Calif.**
**Filed May 18, 1970, Ser. No. 38,377**
**Int. Cl. A01r** *97/10*
**U.S. Cl. 248—38** **8 Claims**



A fishing rod holder has a rocket base with a planar bottom and a curving depending lip adapted to rock on the ship or pier rail or other static rest. Adjustable support arms at the front and rear of the base have free ends whose longitudinal spacing is adjustable. Each support has a rod gripping clamp to grip the rod in the region of the line reel, the rear clamp preferably being a saddle adapted to receive screws from the reel base mount. The span from saddle to saddle is preferably less than the length of the reel mount section of the rod.

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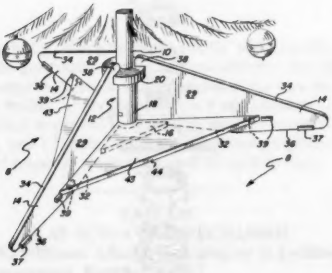
**3,655,156**
**TREE STAND**
**William E. Petrie, 18711 South Cicero Avenue, Tinley Park, Ill.**
**Filed July 10, 1970, Ser. No. 53,935**
**Int. Cl. A47g** *33/12*
**U.S. Cl. 248—48** **17 Claims**



A stand for supporting a pole or the like vertically off the ground, including a hollow cylindrical member in which the pole is received and a plurality of legs removably attached to the pole receiving member and extending radially outwardly therefrom and spaced circumferentially thereabout. The bottom of a pole received in the pole receiving member rests by gravity on portions of the legs extending into the pole receiving member. In the preferred embodiment, the pole receiving member is comprised of two parts for ease of manufacture.

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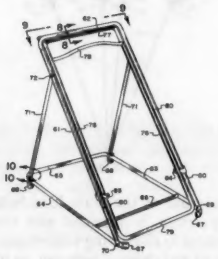
**3,655,157**
**GARBAGE BAG HOLDER**
**Gerald J. Dalton, 459 North 250 East, Kaysville, Utah**
**Filed June 15, 1970, Ser. No. 46,267**
**Int. Cl. B65b** *67/12*
**U.S. Cl. 248—97** **13 Claims**



A holder, for bags made of plastic films and other suitable sheet materials, that will normally maintain the bag closed under its own weight, but that can be easily operated to open when items are to be placed therein.

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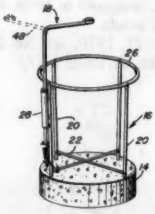
**3,655,158**
**GARBAGE CAN HOLDER**
**Clarence D. Smith, Jr., 187 N. Hidden Beach Road, Marblehead, Ohio**
**Filed Oct. 15, 1969, Ser. No. 866,518**
**Int. Cl. A47g** *29/00*
**U.S. Cl. 248—154** **1 Claim**



A cylindrical concrete base is used to anchor a cylindrical open frame into which a garbage can is placed. A right angle arm is slidably journaled to the frame and is normally biased to urge the can cover in closing relation to the can. Detent means are provided between the frame and the arm to allow temporary positioning of the arm in a fixed position displaced from the can cover thereby permitting the removal of the cover or the entire can from the frame. The frame is constructed to support the bottom of the can in spaced relation to the concrete base thereby preventing the accumulation of

material therebetween. The diameters of the base and the frame are equal to allow rolling of the can holder.

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**3,655,159**
**FREESTANDING SHELVING APPARATUS WITH IMPROVED BASE MEMBER AND COLUMN LOCKING MEANS**

**Charles J. Held, Jr., San Jose, Calif., assignor to W. R. Ames Company, Milpitas, Calif.**

**Filed Mar. 19, 1970, Ser. No. 21,128**
**Int. Cl. F16m *11/20***
**U.S. Cl. 248—188.1** **17 Claims**

An improved base member for a freestanding shelving system comprised of two or more upright columns interconnected by lateral reinforcing members and supporting shelves at various heights. Each base member is formed with a pocket for receiving the lower end of an upright column and a locking means comprised of a pair of wedge members interconnected by a central wedge member that are manipulated to lock the column within the pocket. The base members are constructed to be utilized separately with decorative side panel attachments or to be connected by surrounding kickplate members.

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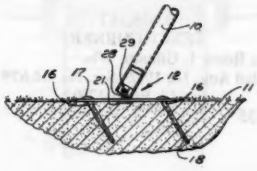
**3,655,160**
**SUPPORT**

**Robert E. Grillot, 9170 West U.S. Route 36, Covington, Ohio**

**Filed Feb. 4, 1970, Ser. No. 8,457**
**Int. Cl. F16m *11/20***
**U.S. Cl. 248—188.8** **3 Claims**




A support for children's swings and the like includes a ground support plate pivotally and swivally connected to a cylindrical member which is insertable into a hollow tubular support leg of the swing framework.

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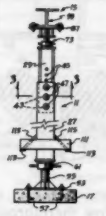
**3,655,161**
**POST SHORE**

**John A. Schueler, 20451 Mooncrest Circle, Huntington Beach, Calif.**

**Filed May 5, 1970, Ser. No. 34,758**
**Int. Cl. E21d *15/20***
**U.S. Cl. 248—354 P** **4 Claims**

A post shore comprising first and second structural members telescopically interrelated to permit roughly adjusting the overall length of the post shore and variable length means for providing relatively fine adjustment of the overall length of the post shore. The lower end of the post shore is connected to an anchor and the upper end of the post shore is releasably connected to overhead structure to thereby permit the post shore to support the overhead structure.



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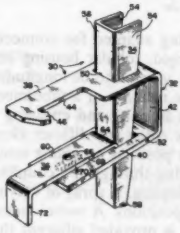
**3,655,162**
**SELF-CONTAINED WALER CLAMP ASSEMBLY FOR CONCRETE WALL FORM**

**James C. Shoemaker, Hampshire, Ill., assignor to Symons Corporation, Des Plaines, Ill.**

**Original application Mar. 19, 1969, Ser. No. 808,503.**
**Divided and this application Oct. 8, 1970, Ser. No. 79,235**
**Int. Cl. E04g *17/00***
**U.S. Cl. 249—219 W** **2 Claims**



An inseparable waler clamp assembly for convenient manual application to the protruding end of a tie rod for securely clamping either a single or a dual waler hard against the outer side of a series of upstanding and edge-to-edge wall form panels. In one form of the waler clamp assembly, the design is such as to accommodate attachment to a cylindrical tie rod or tie wire having a button-like enlargement on one end thereof.

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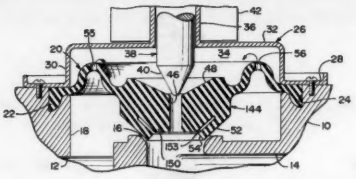
**3,655,163**
**ANTI-HUNTING DIAPHRAGM VALVE**

**William D. Rattan, Paramount, and Harold A. McIntosh, South Pasadena, both of Calif., assignors to Robertshaw Controls Company, Richmond, Va.**

**Filed May 12, 1970, Ser. No. 36,656**
**Int. Cl. F16k *25/00***
**U.S. Cl. 251—45** **11 Claims**

An anti-hunting, pilot controlled, diaphragm valve including a diaphragm disposed in a casing to define a chamber

therewith, a valve face carried by the diaphragm and disposed adjacent a valve seat in the casing to control flow between an inlet and an outlet in the casing, bleed holes in the diaphragm to provide communication between the inlet and the chamber, a central passageway through the valve face to provide communication between the outlet and the



chamber, a pilot valve member cooperating with the passageway to control flow therethrough, and a flexible skirt on the valve face defining a space therein subjected to outlet pressure and having an outer surface subjected to outlet pressure such that the skirt flexes inward with increased inlet to outlet pressure differentials.

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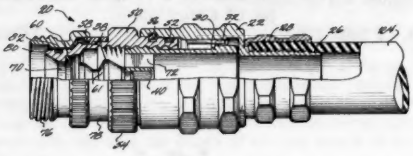
**3,655,164**
**NOZZLE COUPLING**
**Jerry R. Hayes, Peoria, Ill., assignor to L. R. Nelson Mfg. Co., Inc., Peoria, Ill.**
**Filed Feb. 3, 1970, Ser. No. 8,385**
**Int. Cl. F16k** *31/44*
**U.S. Cl. 251—347** **7 Claims**



A nozzle coupling adapted for connection to a hose and provided with a rigid, tubular housing and a spray diffuser and valve element adapted to be longitudinally moved within the housing by the rotation of a tube member also mounted within the tubular housing and engaging the spray and diffuser element. The spray and diffuser element moves from a substantially open position providing minimum flow restriction for fluid passing through the coupling to a closed position sealing the coupling. A spray of varying character results between the two positions. A swivel-mounted, tubular, male coupling member is provided adjacent the coupling exit for connection to another sprinkler or other device.

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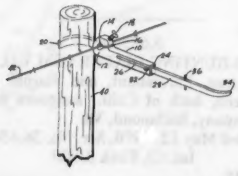
**3,655,165**
**COMBINED STAPLE PULLER AND WIRE STRETCHER**
**Homer W. Wright, P.O. Box 261, Hollandale, Miss.**
**Filed July 1, 1969, Ser. No. 838,194**
**Int. Cl. B66f** *3/00*
**U.S. Cl. 254—77** **8 Claims**



A tool for use in repairing barbed wire or other type of wire fence which is provided with means for removing staples from fence posts to free lengths of wire and additional means to lighten or stretch wire around a post for installing or tightening wire about a post.

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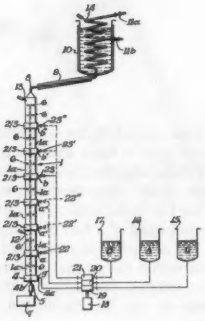
**3,655,166**
**PROCESS AND DEVICE FOR CONTINUOUS PREPARATION OF EMULSIONS**
**Theo Sauer, and Gunter Schulz, both of Perutz Photowerke ZN der Agfagevaert AG. Kistlerhofstr. 75, D-8000, Munich 25, Germany**
**Filed Dec. 21, 1970, Ser. No. 100,029**
**Claims priority, application Germany, Dec. 24, 1969, P 19 64 923.1**
**Int. Cl. B01f** *5/18*
**U.S. Cl. 259—27** **15 Claims**



An emulsion such as suspensions containing silver halide is continuously prepared by conducting the basic component upwards in a closed tubular member and sequentially delivering the further components rotationally in a cross-current direction to the rising basic component and resultant mixture at inlet points arranged one after another with respect to the flow direction.

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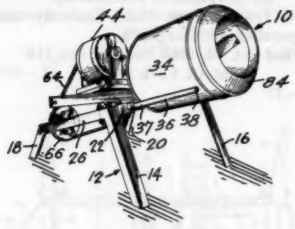
**3,655,167**
**FENCE CORNER**
**Peter W. Skille, Route 1, Gilman, Wis.**
**Filed Aug. 18, 1970, Ser. No. 64,679**
**Int. Cl. E04h** *17/02*
**U.S. Cl. 256—35** **1 Claim**

A corner structure of fencing. This structure consists of a multiple number of posts and cross bars that are held rigidly with cables and turn-buckles so as to remain in proper alignment under all stresses normally encountered.

3,655,168
**PORTABLE CEMENT MIXER**
Ralph Frank Lord, 1451 rue St. Benoit, Ancienne Lorette, Quebec, Canada
Filed Aug. 20, 1970, Ser. No. 65,395
Int. Cl. B28c *5/18*
U.S. Cl. 259—177 10 Claims




A cement mixer having a frame with a pair of spaced rotating supporting rods projecting upward therefrom and adapted to support a container in which cement is to be mixed and a bearing wheel positioned between the two supporting rods and adapted to engage the bottom of a container to support same from sliding down the rods into contact with the frame.

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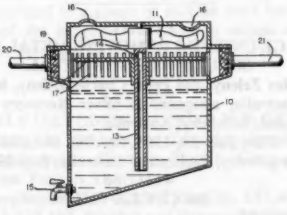
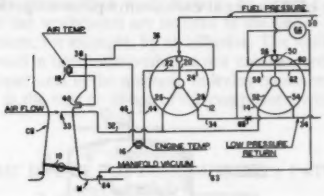
3,655,169
**WATER VAPOR INJECTION SYSTEM AND METHOD FOR AN INTERNAL COMBUSTION ENGINE**
Fred A. Goldfarb, 143 Jewett Avenue, Jersey City, N.J.
Filed June 15, 1970, Ser. No. 46,388
Int. Cl. F02d *19/00*; B01f *5/22*
U.S. Cl. 261—35 7 Claims



A water vapor injection system for an internal combustion engine comprising an air washer and moisturizer for supplying clean moisturized air to a carburetor and method therefore. The device and method comprises a container for containing water or other suitable solution and, having directional scoops on the top for directing the flow of air onto the blades of a fan which is mounted on a hollow shaft immersed in the water with a spinner mounted on the same shaft and ports in the shaft arranged just above the spinner. A slotted impinger ring and a filter are arranged in a circumferential groove around the container and a tube is connected between the groove and a carburetor to supply the clean moisturized air to the carburetor to thereby permit the gas air mixture to burn more efficiently and to reduce exhaust pollution.

3,655,170
**FLUIDIC CARBURETOR**
Jeffrey Michael Lazar, Warminster, Pa., assignor to ACF Industries Inc., New York, N.Y.
Filed Mar. 6, 1970, Ser. No. 17,227
Int. Cl. F02m *69/04*
U.S. Cl. 261—36 A 6 Claims




A fluidic carburetor having two fluid pure fluid amplifiers for controlling the rate of fuel flow to the carburetor bore. One fluid amplifier controls fuel flow during cranking and normal running conditions by sensing the vacuum at one point in a Venturi throat and at a second point upstream therefrom, the rate of fuel flow being dependent upon the difference in pressure at the two points. The rate of fuel flow is further controlled by an air temperature sensor and an engine temperature sensor. A second fluid amplifier is provided for feeding additional fuel to the bore during periods of acceleration.

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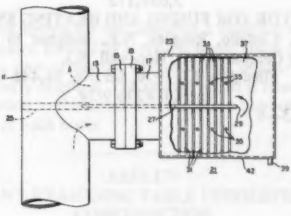
3,655,171
**BOILER SOOT EXTRACTOR**
Harry Francis Miller, Jr., 409 W. Lincoln Avenue, Magnolia, N.J.
Filed Apr. 23, 1969, Ser. No. 818,597
Int. Cl. B01d *47/00*
U.S. Cl. 261—64 R 4 Claims



Apparatus for filtering particles from exhaust gas which by-passes the gas around its normal path and through a plurality of filter screens and utilizes a plurality of water jets for cleaning the filter screens during the filter's operation.

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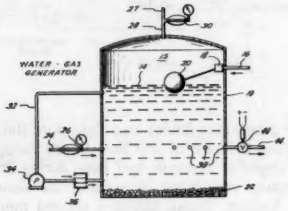
3,655,172
**SATURATED FLUID MIXTURES GENERATOR**
Glenn R. Ingels, 11607 Windy Lane, Houston, Tex.
Continuation of application Ser. No. 719,613, Apr. 8, 1968, now abandoned , which is a continuation-in-part of application Ser. No. 604,515, Nov. 28, 1966, now abandoned , which is a continuation-in-part of application Ser. No. 292,280, July 2, 1963, now abandoned. This application Apr. 14, 1970, Ser. No. 28,192
Int. Cl. C02d *1/00*, *1/04*
U.S. Cl. 261—130 7 Claims

A generator for generating a saturated fluid mixture under close temperature and pressure control including a chamber,

means for introducing liquid water into the chamber and means for introducing into the chamber and into intimate contact with the water, gases from a source means selected from the group consisting of oxidizing and reducing gases for providing in the liquid water a mixture of carbon dioxide, hydrogen and carbon monoxide, and oxidizing and carburizing gases for providing in the liquid water a mixture of carbon dioxide, methane, hydrogen and carbon monoxide. Temperature control means are provided for maintaining the temperature of the water at each control point temperature from




about 32° F. to about 160° F., and pressure regulator means are provided for maintaining the pressure on any given gas mixture pressures from atmospheric up to 218.5 atmospheres so that the saturated fluid mixture is generated.

The chamber includes outlet means for discharge of the generated saturated fluid mixture which is arranged so that the generated saturated liquid mixture retains its properties upon discharge from the chamber so that it can be used to treat metallic and nonmetallic materials to alter their properties. Several embodiments of the generator are shown and described and a number of examples are set forth.

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**3,655,173**

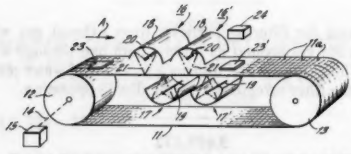
**CONVEYOR FOR FUSING AND HEATING SYSTEMS**

**Bernard J. Costello, Ringoes, N.J., assignor to Argus Engineering Company, Inc., Hopewell, N.J.**

**Filed July 13, 1970, Ser. No. 54,446**

**Int. Cl. F27b** *9/24*

**U.S. Cl. 263—8** **4 Claims**



Apparatus for heating and fusing platings provided upon printed circuit boards and the like. The boards are moved by conveyor means through one or more infrared energy sources arranged at spaced intervals on one or both sides of the boards and adapted to focus radiant energy on the board surfaces, preferably in the form of elongated line images. The conveyor system moves the boards through the plurality of radiant energy sources which heat and fuse the particles of the plating. The conveyor system is comprised of an open-weave mesh belt wherein the "strands" of the belt are provided with bent portions or projections which support the boards being heated a spaced distance above the plane of the belt to substantially eliminate the "shadow effect" caused by the belt which is interposed between the infrared energy sources and the surface of the boards being heated.

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**3,655,174**

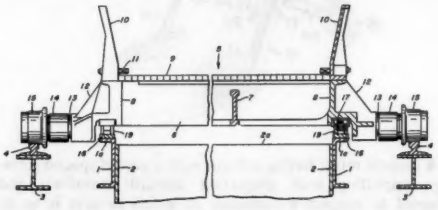
**AIR SEALING DEVICE FOR THE TRAVELING GRATES OF SINTERING MACHINES**

**Werner Veith, Frankfurt am Main, Germany, assignor to Dravo Corporation, Pittsburgh, Pa.**

**Filed Oct. 14, 1969, Ser. No. 866,318**

**Int. Cl. F27b** *21/02*

**U.S. Cl. 266—21** **1 Claim**



This invention relates to sintering apparatus of the type in which a series of pallets or traveling grates carrying the sintering mix passes over a succession of wind boxes with in which a sub-atmospheric pressure is maintained whereby hot gases or air is drawn down through the charge moving thereover and is for an improved seal between the pallets and wind boxes for apparatus of this kind. The improvement in said seal resides in the use of a replaceable, non-lubricated, sliding seal between opposite sides of the grate and the slide bars mounted upon the upper face of the wind boxes or the supports therefor with contact maintained by spring pressure. Thus the mounting of the sealing bars upon the grate is accessible when the sealing device is not seated upon the slide bars of the wind boxes. The grates are supported, upon opposite sides, by a wheel and axle mounted upon guide rails at opposite sides of the wind box openings.

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**3,655,175**

**PACKAGE UNIT FOR REMOVING METAL FROM A SOLUTION OF THE METAL**

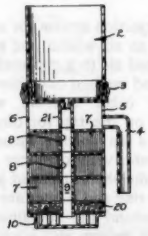
**Victor Vaclav Zeleny, and Peter Charles Zeleny, both of Salisbury, Australia, assignors to Silver Recovery Equipment Pty. Limited, Salisbury, Australia**

**Filed July 28, 1969, Ser. No. 845,205**

**Claims priority, application Australia, July 29, 1968, 41317/68**

**Int. Cl. C22b** *11/12*

**U.S. Cl. 266—22** **7 Claims**



A package unit for recovering precious metals from their aqueous solutions. The package unit is constructed of plastics

such that when the precious metal precipitating agent therein is spent, the unit is disposed in a precious metal recovery process.

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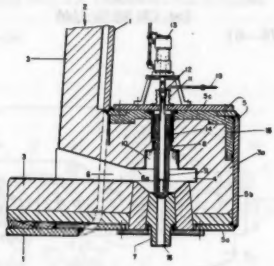
**3,655,176**

## CLOSURE DEVICES FOR METALLURGICAL AND LIKE VESSELS

**Hans-Joachim Winkler, Krenfeld-Uerdingen, Germany, and Hans Richard Fehling, Zug, Switzerland, assignors to Stoecker & Kunz GmbH, Krenfeld-Linn, Germany**

**Filed Feb. 20, 1970, Ser. No. 12,943**
**Claims priority, application Great Britain, Feb. 27, 1969, 10,571/69**
**Int. Cl. C21b 7/14**
**U.S. Cl. 266—38** **8 Claims**



A vessel for containing and discharging molten material is provided with a gas-tight annex chamber offset from but communicating with the interior of the vessel, the bottom of which chamber is not substantially above the bottom of the vessel interior and is provided with a discharge orifice for the downward discharge of the molten material, said orifice being opened and closed by a vertically-movable stopper rod which extends down through the roof of the chamber. The roof of the chamber is formed with a pocket through which the rod extends and in which gas is trapped and pressurized as the level of the molten material in the chamber rises as the latter fills from the vessel. The gas pressure in the pocket may be transmitted to a gauge or may be used for automatic adjustment of the height of the rod to obtain a constant discharge rate through the discharge orifice.

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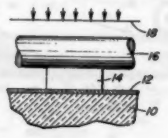
**3,655,177**

## ASSEMBLY INCLUDING CARRIER FOR DEVICES

**Alexander Coucoulas, Bridgewater Township, Somerset County, N.J., assignor to Western Electric Company Incorporated, New York, N.Y.**

**Original application July 6, 1967, Ser. No. 651,411, now Patent No. 3,533,155. Divided and this application Oct. 20, 1969, Ser. No. 870,754**
**Int. Cl. B25b 11/00**
**U.S. Cl. 269—1** **12 Claims**




U.S. Pat. No. 3,533,155, whereof this is a division, concerns a method of bonding which employs a compliant or deformable medium to hold workpiece devices during bonding, the medium transmitting bonding energy to the workpieces and deforming about the workpieces. The invention of this division relates to the compliant medium and to an assembly, useful in compliant bonding of the type described in U.S. Pat. No. 3,533,155. The assembly is provided by the compliant medium plus the devices for which the medium acts as a temporary retainer or carrier. The compliant medium takes the form of a flat sheet of a readily deformable material, such as an elongated tape or ribbon of a metal or an alloy with an oxide surface film. The medium has a thickness substantially greater than workpieces to be bonded. Upper surfaces of the workpieces are secured to the under surface of the medium, for example, by an adhesive. The workpieces are positioned in fixed relationship to one another, preferably in spaced apertures in the medium. Indexing means may also be present in the tape or ribbon of the compliant medium.

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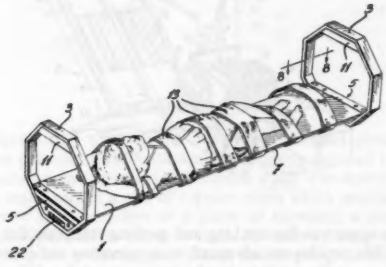
**3,655,178**

## PEDIATRIC DEVICE FOR IMMOBILIZING A PATIENT-CHILD

**Jean A. Vezina, Cartierville, Montreal, Quebec, Canada, assignor to Les Entreprises Jean A. Vezina LTEE, Montreal, Quebec, Canada**

**Filed Apr. 12, 1968, Ser. No. 720,917**
**Int. Cl. A61g 13/00**
**U.S. Cl. 269—323** **8 Claims**




A pediatric device for immobilizing a child for a period of time, the device formed of a resting board fixed at the ends thereof to a pair of spaced upright equal regular octagonal hoops, similarly oriented. The resting board is fixed eccentrically in relation to the hoops and the plane thereof is parallel to one side of each hoop.

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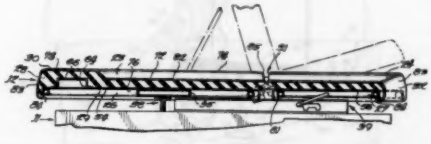
**3,655,179**

## PHYSICIAN'S EXAMINING TABLE UPHOLSTERED TOP CONSTRUCTION

**Joseph J. Lelugas, Two Rivers, Wis., assignor to American Hospital Supply Corporation, Evanston, Ill.**

**Filed Aug. 29, 1969, Ser. No. 854,178**
**Int. Cl. A61g 13/00**
**U.S. Cl. 269—324** **2 Claims**



An upholstered top for a physician's examining table, having a head and a foot section of which at least one section is

pivotable. The top comprises a pair of frames adapted to be pivotally secured to the table, two pan-like liners which are secured to the frame, a one-piece foam cushion which is supported by the liners, and a formed one-piece vinyl cover. The cover is secured to the upper surface of the cushion, and it is also secured to the liners by a lip formed at the lower edge of the cover. Both the cushion and cover have an easily cleaned broad crease at the pivot axis to facilitate bending of the cushion and cover on pivoting of the head and foot sections. The foot section of the top has a shallow V-shaped cutaway at the end of the foot section to facilitate using a treatment pan while adequately supporting the patient.

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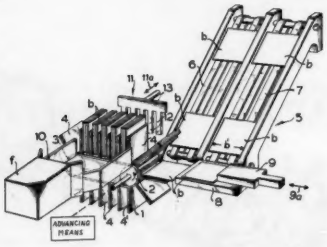
**3,655,180**
**PACKING OF RELATIVELY FLAT ARTICLES**
**Hans Holler, Bergisch Gladbach, Germany, assignor to Gebruder Holler GmbH, Bergisch Gladbach, Germany**
**Filed Aug. 5, 1969, Ser. No. 847,553**
**Claims priority, application Germany, Aug. 24, 1968, P 17 86 161.9**
**Int. Cl. B65h** *39/02*
**U.S. Cl. 270—58** **8 Claims**




An apparatus for stacking and packing relatively flat articles. The articles are advanced to an operating station where they are gathered into stacks in superposed relationship. Thereupon each stack is turned so as to stand on edge and is, while being guided at its opposite major surfaces, inserted edgewise into a receptacle.

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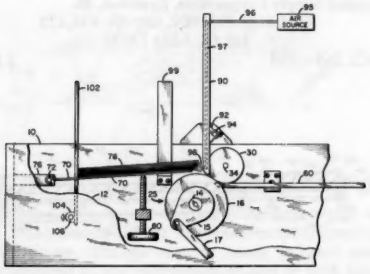
**3,655,181**
**PRINTING PRESS FEEDER**
**Harold E. Paulson, 32 Island Road, St. Paul, Minn.**
**Filed Dec. 23, 1970, Ser. No. 100,851**
**Int. Cl. B65h** *3/10*
**U.S. Cl. 271—29** **7 Claims**




A mechanism for feeding lightweight sheets of paper, one at a time, to a printing press in which a rotationally oscillated vacuum drum with suction holes therein grasps pieces of paper off the bottom of a stack with each oscillation. The stack is adjustably supported at a predetermined height just above the oscillating feed drum to insure that only one piece of paper at a time is selected. An air jet is used to separate the edges of the paper sheets in the stack while a separating plate next to the drum operates to block off the suction holes at the end of each oscillation and separate each piece of paper from the oscillating drum.

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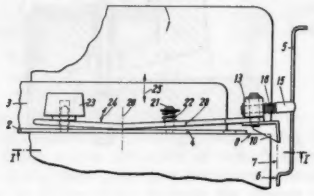
**3,655,182**
**SHEET-SEPARATION DEVICE FOR SHEET WORKING MACHINES**
**Alfons Rilinger, Konigslutter, Germany, assignor to Roto-Werke GmbH, Konigslutter, Germany**
**Filed Mar. 30, 1970, Ser. No. 23,747**
**Claims priority, application Germany, Apr. 1, 1969, P 19 16 623.5**
**Int. Cl. B65h** *3/46*
**U.S. Cl. 276—61** **5 Claims**



A sheet separation device for sheet working machines, which comprises a pile table having side rails and a sheet feeder movable in the direction of height relative to the pile table. Separating elements overlap the forward edges of the uppermost sheet freely movably guided in vertical direction and laterally adjustable. A setting lever is adapted for adjustment of the separating elements and mounted swingably only about a substantially vertical axis on a complementary of the side rails. An adjustment- and securing-device is disposed likewise swingably on the side rails and operates without steps, and a guide permits movements of the separating elements in vertical direction and is disposed on the forward end of the setting lever.

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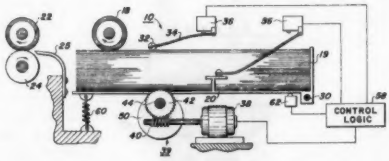
**3,655,183**
**SHEET FEED APPARATUS**
**John W. Wagner, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.**
**Filed July 13, 1970, Ser. No. 54,140**
**Int. Cl. B65h** *1/18, 3/06*
**U.S. Cl. 271—62** **1 Claim**




Sheet feed apparatus comprising a frame, a tray for supporting a stack of sheets adapted to be fed along a predeter-

mined path, the tray mounted for pivotable movement on an axis a direction away from the direction in which feed is to be affected, a cam member operatively engageable with the lower portion of the tray to continually pivot the tray in an upward direction on the high rise portion of the cam and then return the tray to its original position upon a rotation of the cam to the low rise portion, drive means for operatively rotating the cam member in intermittent fashion upon receipt of discrete electrical signals, and control means associated with the stack for actuating the drive means when the top of the stack falls below a predetermined plane until the sheets have been fed.

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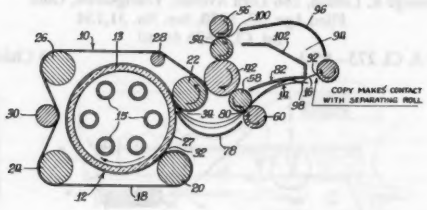
**3,655,184**
**AUTOMATIC SHEET SEPARATING APPARATUS**
**Terrence G. Seelenbinder, Rolling Meadows, Ill., assignor to Addressograph-Multigraph Corporation, Mt. Prospect, Ill.**
**Filed Nov. 13, 1969, Ser. No. 876,264**
**Int. Cl. B65h** *3/46*
**U.S. Cl. 271—64** **2 Claims**




An automatic sheet separating device is disclosed including a pair of feed rollers rotatably mounted in driving relation with respect to each other. One of the feed rollers is rotated at a speed greater than the other to advance a first sheet of a pair passing between said rollers more rapidly than the other sheet of the pair. A roughened roller mounted for rotation in the path of the moving pair of sheets is provided to intercept the lead sheet and to deflect it in another direction, and at the same time, separate it from the more slowly advancing sheet.

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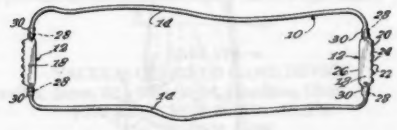
**3,655,185**
**ELASTIC TYPE EXERCISER WITH ELASTICALLY HELD HAND GRIP ASSEMBLY**
**Gerald E. Kane, 1107 West Park Front, Joliet, Ill.**
**Filed Apr. 23, 1970, Ser. No. 31,196**
**Int. Cl. A63b** *21/00, 21/02*
**U.S. Cl. 272—82** **6 Claims**



An exercising device having a pair of resiliently connected handles. Each handle has a gripping portion which extends through the user's hand to provide a hand-grasp during exercise, and connecting portions which are integral with and extend longitudinally from respective ends of the first portion. A pair of elastic tubes of equal lengths connect the handles and have an internal diameter less than the diameter of the connecting portions of the handles. One connecting portion of each handle is resiliently received in the end of a tube to interconnect the handles and allow flexation of the device by the user.

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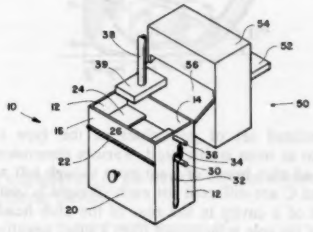
**3,655,186**
**STACKER FOR PAPER CURRENCY**
**Jack E. Bayha, Chesterland, Ohio, assignor to ARDAC/USA Incorporated, Geauga County, Ohio**
**Continuation-in-part of application Ser. No. 64,947, Aug. 19, 1970, now abandoned. This application Dec. 14, 1970, Ser. No. 97,739**
**Int. Cl. B65g** *57/03*
**U.S. Cl. 271—88** **14 Claims**



Disclosed is a device for receiving individual pieces of paper currency and for stacking successively received pieces of currency in a compact and uniform stack. The device consists essentially of a pair of support plates which receive and support opposite edges of a piece of currency, a plunger which is adapted to move downwardly to force the piece of currency below the support plates, and a spring-loaded bottom plate which moves downwardly with the plunger. Upon upward movement of the plunger, the piece of currency is retained below the lower surfaces of the support plates and the bottom plate.

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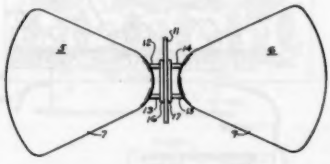
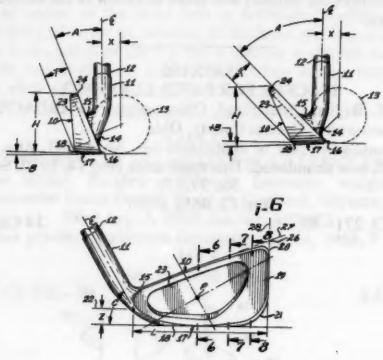
**3,655,187**
**GAME TABLE WITH CENTRALLY DISPOSED APERTURED BARRIER**
**Jack H. Pugsley, 1610 S.W. 23 Avenue, Fort Lauderdale, Fla.**
**Continuation-in-part of application Ser. No. 827,418, May 23, 1969. This application Feb. 11, 1970, Ser. No. 10,538**
**Int. Cl. A63b** *39/00*
**U.S. Cl. 273—30** **3 Claims**



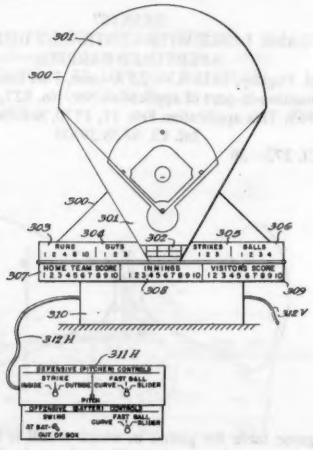
A game table for games in which a ball is bounced on a table surface, wherein the table is formed of two surfaces separated from each other to provide a surface level open space therebetween, with a barrier having an opening therein between said separate surfaces.

**3,655,188**
**CORRELATED GOLF CLUB SET**
**Karsten Solheim, 10834 North 21st Avenue, Phoenix, Ariz.**
**Filed July 9, 1969, Ser. No. 840,321**
**Int. Cl. A63b** *53/00*
**U.S. Cl. 273—77 A** **13 Claims**



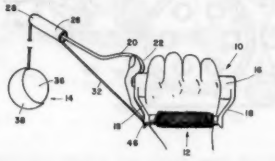
A correlated set of golf clubs of the type commonly referred to as irons is disclosed. Various dimensions are the same for all club heads of a set even though loft and lie angles A and C are different for each. Weight is controlled by the depth of a cavity in the rear of the club head. A slope angle B of the sole is increased from a small negative value to a larger positive value as loft is increased from a minimum to a maximum, with substantially zero slope for a midrange club of the usual set of clubs numbered 1 to 9.

**3,655,189**
**AUTOMATIC ELECTRIC BASEBALL GAME**
**Delbert S. Alexander, Jr., Evanston, Ill., assignor to State National Bank, Evanston, Ill.**
**Continuation of application Ser. No. 683,885, Nov. 17, 1967, now abandoned. This application June 22, 1970, Ser. No. 48,505**
**Int. Cl. A63f** *9/00*
**U.S. Cl. 273—88** **15 Claims**



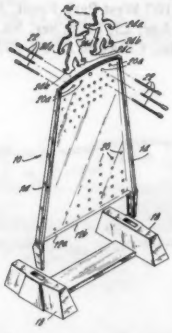

A baseball game apparatus includes a defensive control unit with pitch selection switches manually controlled by a player serving as pitcher, and an offensive control unit with pitch anticipation switches on which a player serving as batter selects and swings at or passes an anticipated pitch. A mixer stepping unit randomly selects the resulting play from a category of plays determined by the degree of correspondence between the defensive and offensive pitch switches. The selected play controls sequential energization of a series of lights under a translucent playing field to simulate the movement of a batted all. A player stepping unit energizes a further series of lights to animate men which converge towards the batted ball flight path. A base running relay energizes lights arranged in a diamond-shaped pattern to animate runners advancing around a base path. Interlocking relays allow one runner to be held on a base while another runner advances. A motor driven play animation unit energizes further series of lights to simulate the ball being returned to the infield. A plurality of stepping relays records the progress of the game, and in response to predetermined positions, such as third out, control energization of the relays and lights to modify the game condition then being displayed.

**3,655,190**
**TETHERED BALL WITH CORD LENGTHENING MEANS**
**George E. Lemon, 286 Lora Avenue, Youngstown, Ohio**
**Filed Apr. 23, 1970, Ser. No. 31,134**
**Int. Cl. A63b** *69/40*
**U.S. Cl. 273—95 A** **3 Claims**



An amusement device in the form of a light ball fastened to an elastic cord and a hand grip for holding the outer end of the cord and a supply of additional cord. Circular movement of the hand and wrist will cause the ball to swing in a circular or elliptical path and the user attempts to keep the ball moving by hitting it, either with his hand or with a paddle, every time the ball swings toward him.

**3,655,191**
**GAME WITH FREE FALL PLAYING PIECES AND SELECTIVELY PLACED SUPPORT PEGS**
**Perry J. Grant, Pacific Palisades, Calif., assignor to Reuben Klamer, d/b/a Reuben Klamer & Associates, Beverly Hills, Calif.**
**Filed June 1, 1970, Ser. No. 41,790**
**Int. Cl. A63f** *9/00*
**U.S. Cl. 273—95 R** **3 Claims**



A child's game includes an upright playing board comprising two sheets of transparent plastic having peg holes therein

and a pair of playing pieces adapted to be supported between said sheets by pegs removably inserted in said peg holes. The object of the game is to advance a playing piece from an initial support position at the upper edge of the playing board to a winning support position at the lower edge of the board by alternatingly inserting and removing support pegs, permitting the playing piece to fall from one support position to another down the board. The game is preferably played by two players or two teams of players each having a playing piece and three support pegs, with the players alternating turns until one reaches a winning position.

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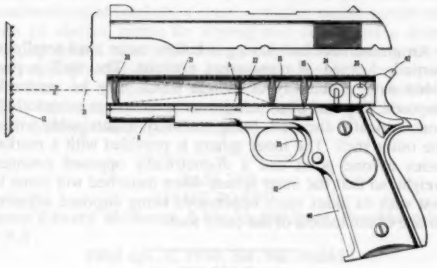
**3,655,192**
**LIGHT RAY PROJECTOR AND TARGET**
**Roger L. Hall; Gordon M. McKenney, Jr., and Alfred J. Wall, all of P.O. Box 375, Londonderry, N.H.**
**Filed Nov. 4, 1969, Ser. No. 873,844**
**Int. Cl. A63f** *9/02*
**U.S. Cl. 273—101.1** **15 Claims**



A light-emitting target gun and a cooperative target corner reflector. The gun and target accurately simulates target practice with live ammunition and is adaptable for amusement use. The target gun has a light projector housed in the gun barrel which can be momentarily activated by pulling the trigger of the gun. The light source is illuminated at a first light level and thereafter at a second level lower than the first level. The diameter of the light beam projected from the gun can be adjusted by moving a selected size hole of a multihole plate into a lens system within the barrel. The target reflector is located at a fixed distance from the operator of the weapon and is adapted to reflect the impinging light pulse. An improved circuit and light projector are also provided to cause, respectively, activation of the light source and provide an efficient, accurately defined light beam.

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**3,655,193**
**VACUUM CUP-HELD GAME DEVICE**
**Darrell R. Jones, 821 Vine Street, Hamilton, Ohio**
**Filed July 9, 1970, Ser. No. 53,558**
**Int. Cl. A63h** *33/18*
**U.S. Cl. 273—106 R** **5 Claims**

A game device having a hollow elongated body and resilient vacuum cups mounted at ends of the body. A partition in the body spaced from the vacuum cups forms air columns inside the body in communication with the interiors of the vacuum cups. Each of the vacuum cups can hold the device on a surface engaged thereby, and air from one of the air columns permits the engaged vacuum cup to partially expand after engagement of the device with the surface to permit ready release thereof.

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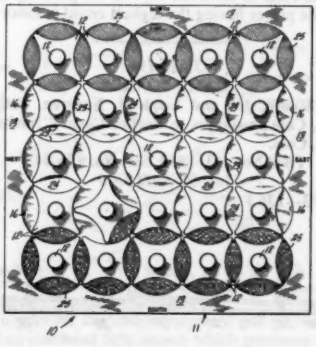
**3,655,194**
**BOARD GAME APPARATUS**
**Daniel H. Pierson, P.O. Box 5, Sloatsburg, N.Y.**
**Filed Apr. 27, 1970, Ser. No. 32,149**
**Int. Cl. A63f** *3/02*
**U.S. Cl. 273—131 B** **2 Claims**



A game apparatus formed by a base, an array of rotators formed to provide elongated spaces and playing pieces in the spaces, enables one or more players to engage in a wide variety of games. The rotators, when positioned in alignment at one of a plurality of angular positions, provide such elongated spaces common to two adjacent rotators to enable

movement and transfer of the playing pieces. The basic playing move is accomplished by grasping and turning one of the rotators from one to another of its aligned positions which shifts at least one playing piece out of juxtaposition with one rotator and into juxtaposition with another rotator. Each rotator is provided with means for selectively releasably locking it in any one of four positions. The playing pieces are of tapered form to facilitate tilting thereof for removal from the rotators.

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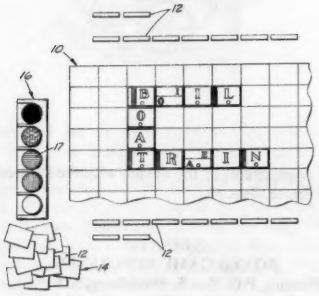
**3,655,195**
**WORD FORMING GAME APPARATUS**

**Frank R. Bean, and Dorothy Aday Bean, both of P.O. Box 6232, Anaheim, Calif.**

**Filed Mar. 4, 1971, Ser. No. 120,824**
**Int. Cl. A63f 3/00**
**U.S. Cl. 273—135 D** **3 Claims**



A word-forming game apparatus comprising lettered playing pieces, each having thereon one or more color bars representative of the value of the letter, such value being inversely proportional to the frequency of occurrence of the letter. The players arrange the pieces to form words, with the pieces used being selected so as to score the highest possible number of points, and are awarded chips corresponding in number and color to the color bars on the pieces played. The winner is the player having the highest count in color chips.

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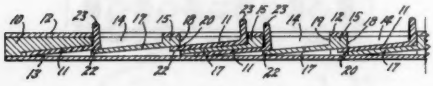
**3,655,196**
**GAME BOARDS**

**James F. Moore, Jr., and Leigh H. Norgren, both of Englewood, Colo., assignors to Norbro Corp. ("Norbro"), Englewood, Colo.**

**Filed Nov. 13, 1969, Ser. No. 876,448**
**Int. Cl. A63f 3/00**
**U.S. Cl. 273—136 F** **2 Claims**



A bingo board having a number board having vertical, spaced-apart columns of rectangular depressions in the upper and lower faces thereof, each upper face depression having a fixed inclined bottom plate carrying a game number and a slide member resting on the inclined bottom plate of each depression, the slide members being slidable down the inclined bottom plates to a position below the bottom plate of a next adjacent upper face depression and within the corresponding lower face depression. Each upper face depression communicates with an adjacent lower face depression through an opening which receives the slide member.

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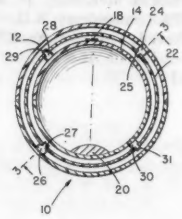
**3,655,197**
**RANDOM SELECTION BALL FORMED OF CONCENTRIC SPHERES**

**Michael Milbaum, 1581 Utica Avenue, Brooklyn, N.Y.**

**Filed Aug. 21, 1970, Ser. No. 65,896**
**Int. Cl. A63f 5/04**
**U.S. Cl. 273—138 R** **6 Claims**



An amusement ball having a hollow outer shell totally or partially formed of transparent material. The shell is provided with a plurality of indicia which may be randomly disposed. The ball also includes an inner sphere substantially concentrically disposed, being rotatably maintainable within the outer shell. The inner sphere is provided with a marker index at one point and a diametrically opposed counterweight, so that the inner sphere when disturbed will come to rest with its index mark uppermost, being disposed adjacent to one of the indicia of the outer shell.

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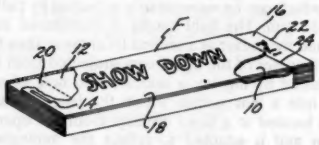
**3,655,198**
**PACK OF GAME PLAYING TICKETS**

**Eugene F. Broughton, 2204 Conquista Avenue, Long Beach, Calif.**

**Filed Nov. 23, 1970, Ser. No. 91,917**
**Int. Cl. A63f 1/00**
**U.S. Cl. 273—139** **5 Claims**

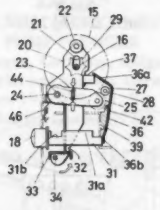



An amusement device which includes a number of elongate rectangular playing sheets separated by opaque spacer sheets of lesser length arranged in a pack with the tearable sheets and spacer sheets being removably secured to one another. Each of the playing sheets has a number of randomly selected insignia of different appearance imprinted thereon. The insignia when arranged in predetermined sequences or groups have a certain game value that is agreed upon by the players. Due to the differential in length of the playing sheets and the spacer sheets, each playing sheet has a second end portion that provides a tab that may be gripped by the fingers. The tabs are employed by the players to separate the playing sheets from the pack to determine which player has a winning score.

## 3,655,199
## MOTOR DRIVEN ROTATABLE DRUM CHANCE DEVICE

Haruo Ohki, 2-10, 2 chome, Shiratari, Katsushika-ku, Tokyo, Japan

Filed July 8, 1970, Ser. No. 53,244
Claims priority, application Japan, Nov. 20, 1969, 44/109729
Int. Cl. A63f 5/04
U.S. Cl. 273—143 R 7 Claims

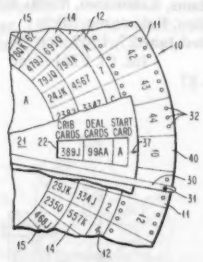



An amusement device is disclosed which essentially comprises a plurality of display drums each provided on its peripheral surface at circumferentially spaced positions with combinations of symbols, a drum actuating means connected with an electric motor for driving said drums and a drum braking means associated with a push-button arrangement for stopping rotation of the drums successively so as to pair or match the symbols on one drum with those on another, and a handle lever for releasing the depressed push-buttons and resuming rotation of the drums.

## 3,655,200
## GAME BOARD

James Edward McManus, 2 Flower Hill Road, Poughkeepsie, N.Y.

Filed Apr. 8, 1970, Ser. No. 26,661
Int. Cl. A63f 1/06
U.S. Cl. 273—148 R 4 Claims

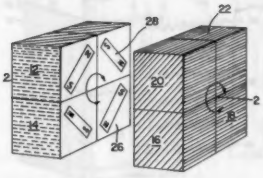



A game board for playing cribbage comprising three discs mounted on a spindle for rotation with respect to each other. One is a card disc having printed on both sides thereof indices, representing card values, said indices being arranged in groups comprising hands, cribs and start cards. The other two discs, a dealers disc and a non-dealers disc are mounted on each side of said card disc and are each provided with a window disclosing the indices of the cards for one hand. Also mounted on said spindle are two arms, one for each player, said arms each having a pin in the free end thereof adapted to engage perforations, comprising a peg board, in said card disc.

## 3,655,201
## PATTERN FORMING PUZZLE AND METHOD WITH PIECES ROTATABLE IN GROUPS

Larry D. Nichols, Arlington, Mass., assignor to Moleculon Research Corporation, Cambridge, Mass.

Filed Mar. 4, 1970, Ser. No. 16,473
Int. Cl. A63f 9/08
U.S. Cl. 273—153 R 10 Claims

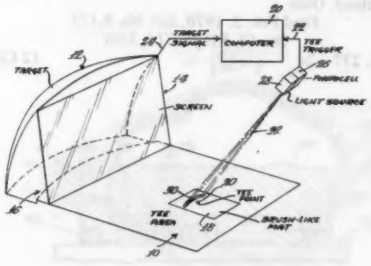



Eight cube-type pieces are magnetically engaged to form a cube-type assembly with educational and entertaining features. The cubes are adapted to rotate in complementary sets of four about one of three mutually perpendicular axes. Each cube has colored surfaces and when properly arranged one distinct color on each of the six faces is presented. Each set which shares one face of the assembly may be rotated in multiples of 90° with respect to the other set. If the assembly is initially arranged properly and then disarranged by a random sequence of rotations, it then serves as a device whose object is the restoration of the original arrangement.

## 3,655,202
## GOLF GAME

Michael G. Gautraud, Muskegon, and James W. Sanders, Grand Haven, both of Mich., assignors to Brunswick Corporation

Filed Oct. 20, 1969, Ser. No. 867,448
Int. Cl. A63b 67/02, 69/36
U.S. Cl. 273—176 FA 6 Claims

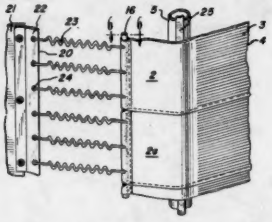



A tee trigger for use in computerized golf games. There is provided an overhead light source which generates a a line of light crossing a tee area in such a way that a ball hit from a line simulating means will break the line of light and reflect light to an overhead photocell to generate a first signal. A second signalling device is spaced from the projected line of light and provides a second signal when the ball reaches that point and the time between the two signals is indicative of the ball's velocity. Through the use of the line of light, the life of the lie simulating means may be increased inasmuch as the ball need not be placed at but a single point thereon for each shot.

## 3,655,203
## PENETRABLE TARGET SCREEN

Anthony J. Gretzky, Muskegon, Mich., assignor to The Brunswick Corporation

Filed Oct. 30, 1970, Ser. No. 85,607
Int. Cl. A63b *69/36*
U.S. Cl. 273—181 R 7 Claims



The invention is an improvement in the construction of a penetrable target screen comprised of an adjacent series of narrow parallel strips of tape so mounted as to permit target images to be projected thereon and the passage therebetween of an object propelled at the target. The improved screen is comprised of a relatively small number of individually mounted broad tape sections, which sections are slit providing a multitude of adjacent narrow parallel strips supported by common end portions between which a projectile may pass. Stiffening pins are located in cylindrical pockets at the ends of the broad tape sections. Tension springs connect the stiffening pins to a supporting frame. The broad tape sections slightly overlap each other and bear against strips of low friction material provided on two parallel spaced apart upright supporting members.

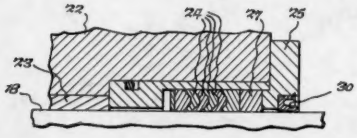
## ERRATUM

For Class 274—14 see:
Patent No. 3,655,325

## 3,655,204
## ROD WIPER

Ward Sievenpiper, Milgrove, N.Y., assignor to A-T-O Inc., Cleveland, Ohio

Filed Feb. 3, 1970, Ser. No. 8,175
Int. Cl. F16j *15/16*, *9/08*
U.S. Cl. 277—24 12 Claims

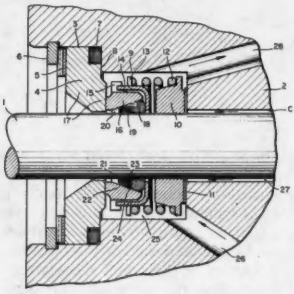


A wiper adapted to fit within a cavity of a first member, such as the housing of an hydraulic cylinder, and wipe against a second relatively reciprocable member, such as the rod of an hydraulic cylinder. The wiper comprises an annular body of synthetic plastic material, preferably urethane, having a generally planar axial end face and formed at the opposite axial end face into a first annular flange of generally frusto-conical outline extending generally axially therefrom and terminating in a sharp winding edge at the inner surface thereof. The body also is formed at the same end face into a second, axially extending annular flange spaced radially outwardly from the first flange to define an annular groove therebetween and having an annular shoulder on the outer surface thereof adapted to abut an annular retaining lip formed in the cavity.

## 3,655,205
## ROTARY SEAL, PARTICULARLY FOR OIL PUMPS

Jorgen Hartvig Petersen, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Continuation of application Ser. No. 781,109, Dec. 4, 1968, now abandoned. This application Nov. 3, 1970, Ser. No. 86,604
Claims priority, application Germany, Jan. 16, 1967, P 16 75 220.8
Int. Cl. F16j *15/34*
U.S. Cl. 277—87 2 Claims

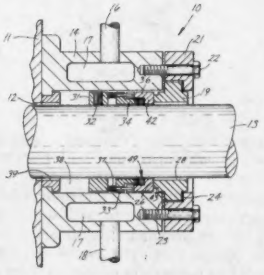


The invention relates to a rotary seal unit of the type used for oil pumps and the like. A plastic backing ring having a tapered surface is nested in a conical recess of a face ring. The taper angle of the tapered surface of the backing ring is larger than the taper angle of the conical recess. A resilient sealing ring is spring biased to force the plastic backing ring into contact with the face ring which in turn is biased into sealing engagement with a fixed sealing surface of a stationary bearing block.

## 3,655,206
## MULTILAYER GRAPHITE SEAL RING

William V. Adams, Kalamazoo, Mich., assignor to Durametallic Corporation, Kalamazoo, Mich.

Filed June 27, 1969, Ser. No. 837,061
Int. Cl. F16j *15/38*
U.S. Cl. 277—87 14 Claims



An improved seal ring construction for use between a pair of relatively nonrotatable elements of a shaft seal assembly.

An annular sealing ring is constructed of a multilayer graphite material and has one axial end face thereof in bearing engagement with a support surface formed on one of the elements, which support surface is substantially transverse to the axial direction of the sealing ring. The other axial end face of the sealing ring bears against an annular control member, which in turn bears against the other element. A wedge-shaped portion contacts one corner of the sealing ring to apply a radially inward and axial compressive force thereto.

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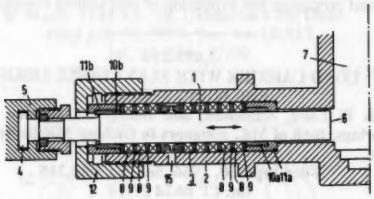
**3,655,207**

**SEALING AND LUBRICATING DEVICE FOR PISTON PUMP PLUNGER**

**Kurt Schettler, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany**

**Filed Jan. 19, 1970, Ser. No. 3,793**
**Claims priority, application Germany, Jan. 31, 1969, P 19 04 758.6**
**Int. Cl. F16j** *15/18*
**U.S. Cl. 277—125** **5 Claims**




Each of a plurality of intermediate rings is positioned between a pair of next-adjacent packing rings and has an inner surface bordering the plunger of a piston pump. Each of the intermediate rings has a substantially annular groove formed in the inner surface thereof.

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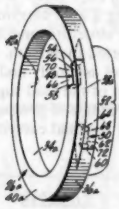
**3,655,208**

**SPLIT PISTON RING AND METHOD OF MANUFACTURE**

**James V. Walker, Redondo Beach, Calif., assignor to McDonnell Douglas Corporation**

**Filed Apr. 13, 1970, Ser. No. 27,961**
**Int. Cl. F16j** *9/06, 9/14*
**U.S. Cl. 277—221** **4 Claims**



A plastic or plastic-like piston ring of the expandable type for use in hydraulic and pneumatic actuators is constructed from a single annular member and the expansion and contraction capabilities are provided by partially radially slitting the ring and by cutting a pair of stepped joints through opposite sides of the ring.

**3,655,209**

**METALLIC SEALING MEMBER FOR LOCKING AND SPLIT DEVICES**

**Georgy Filippovich Polyakov, ulitsa Akademicheskaya, 23, kv. 8.; Vladimir Lvovich Vanin, ulitsa Gogolya, 31, kv. 35., and Vladimir Alexandrovich Kamardin, ulitsa Dachnaya, 25, kv 71., all of Novosibirsk, U.S.S.R.**

**Filed Dec. 22, 1969, Ser. No. 887,222**
**Claims priority, application U.S.S.R., Feb. 20, 1969, 1300958**
**Int. Cl. F16j** *15/08*
**U.S. Cl. 277—235 R** **5 Claims**

The present invention discloses a metallic sealing members used, for instance, in valves, and having a hermetically sealing coating.

In accordance with the present invention the method of forming a hermetically sealing coating is carried out both with the aid of a metallic packing disposed between the contacting surfaces of sealing members, and directly from the materials of these members.

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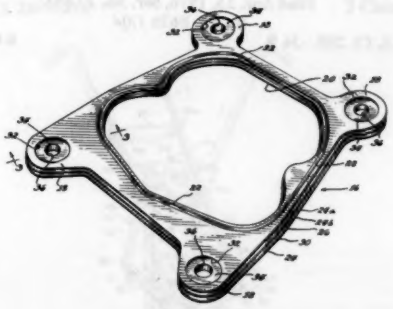
**3,655,210**

**HIGH TORQUE RETENTION HEAT INSULATIVE GASKET STRUCTURE**

**Robert G. Farnam, New Libson, and Michael T. Passarella, Wisconsin Rapids, both of Wis., assignors to F. D. Farnam Co.**

**Filed Sept. 29, 1970, Ser. No. 76,459**
**Int. Cl. F10j** *15/06*
**U.S. Cl. 277—235 B** **24 Claims**



A gasket structure permitting the selective variance of components thereof whereby high torque retention, heat insulating and fluid-tight sealing is obtained. The specific disclosure and application of use is in a gasket-heat-insulating assemblage for providing insulating and sealing functions between, for instance, the throttle body and bowl or the throttle body and the manifold of an internal combustion engine carburetor assembly. By increasing the density of the

heat insulating member at the bolt hole portions by which the member is retained in the assemblage, as by means of densification or the provision of a suitable insert member, torque retention and the spring effect of the member may be controlled. Additionally, by providing gasket layer components on one or both sides of the insulating member, especially where one is furnished with a sealing band, fluid-tight sealability in the intended field of use is maximized. Methods for forming specific specific constructions are also disclosed.

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**ERRATUM**

For Class 277—237 see:
Patent No. 3,655,213

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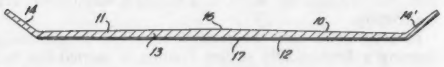
**3,655,211**
**DOUBLE BEND STAVE**

**Jerome Bollettieri, 151 Southwood Circle, Syosset, N.Y., and Arne Dalen, deceased, late of 36 Boxwood Lane, Hickswille, N.Y. (by June Dalen, administratrix)**

**Filed Apr. 1, 1970, Ser. No. 24,515**
**Int. Cl. A63c** *5/00*
**U.S. Cl. 280—11.13 S** **10 Claims**



Staves which are useful as skis on snow and water. The staves are characterized by their substantially equal bends at their front and rear ends, total length of about 30–98 inches and width in the area between the bends of about 4.5–5.25 inches. The ratio of total length to width in the area between the bends, when the stave is less than 36 inches, is preferably 1:0.13–1:0.15. The staves have a grooved lower surface. The staves permit a high degree of stability, while retaining good maneuverability.

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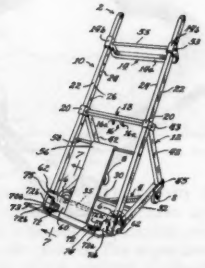
**3,655,212**
**SELF-SUPPORTING CART**

**Morton Krass, 808 Fitzhenry Court, Glenwood, Ill., and Walter Nelson, 8008 South Chicago Avenue, Chicago, Ill., assignors to said Krass, by said Nelson**

**Filed Apr. 13, 1970, Ser. No. 27,885**
**Int. Cl. B62b** *1/04*
**U.S. Cl. 280—36 R** **6 Claims**



A self-supporting cart includes a base frame carrying a front pair of laterally spaced roller means and a rear pair of laterally spaced roller means, and a load-receiving frame pivoted to the front end portion of the base frame. The bottom ends of a pair of elongated bracing members are pivotably connected to the rear end of the base frame and the upper ends thereof are pivotably connected to a pair of slide members slidable along the load-receiving frame. A pair of retractable pins operated by a pair of squeeze handles selectively lock the slide members in any one of a number of different positions along the load-receiving frame. The base frame has a U-shaped configuration opening to the rear of the cart.

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**3,655,213**
**MEANS FOR SEALING A JOINT, FILLING A SPACE AND THE LIKE**

**Kiell Rudolf Forsgren, Orebro, Sweden, assignor to United Shoe Machinery Company AB, Abyvagen, Orebro, Sweden**

**Filed May 25, 1970, Ser. No. 40,408**
**Int. Cl. F16j** *15/00*
**U.S. Cl. 277—237** **4 Claims**

The invention concerns a means for sealing joints or the like with a heat expandable sealing compound, the necessary heat being provided by aid of a heat providing means cooperating with the sealing compound. The new and inventive feature resides in the fact that the expanding agent of the sealing compound, when actuated by the heat providing means, generates at least part of the heat necessary to maintain and propagate the expansion of said sealing compound.

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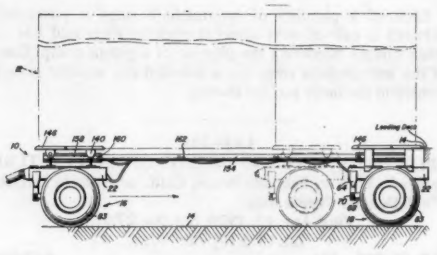
**3,655,214**
**LOAD CARRIER WITH ELEVATABLE LOAD ENGAGING SURFACE**

**Frank B. Lane, Annapolis, and George M. Fulmer, Silver Springs, both of Md., assignors to Gichner Mobile Systems, Inc.**

**Filed Sept. 30, 1966, Ser. No. 583,245**
**Int. Cl. B62d** *21/18*
**U.S. Cl. 280—43.23** **12 Claims**



A towed vehicle including two wheeled units normally spaced apart by a reach pole and capable of being moved towards and away from each other when loading a load carrying body or unloading a load carrying body. Each wheeled unit includes a frame structure and an axle and wheel assembly pivotally supported therefrom. Air bag units interconnect the axle and wheel assembly and the frame for varying the elevational position of the load supporting surface on the wheeled units. A self-contained pressure tank is provided for enabling adjustment of the load carrying surface independent of any towing vehicle.

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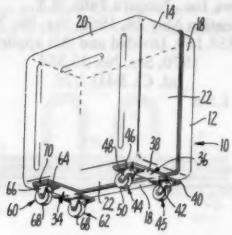
**3,655,215**
**PORTABLE EQUIPMENT CASE**

**Dennis M. Becklin, Santa Clara, Calif., assignor to Crate-Rite, Incorporated, Union City, Calif.**

**Filed June 5, 1970, Ser. No. 43,809**
**Int. Cl. B62b** *5/00*
**U.S. Cl. 280—79.2** **5 Claims**

A portable equipment case including a base portion and a cover portion adapted to be secured together to confine equipment therein. At least one bracket member is attached

to one of said portions and includes an integral extension having a support wheel affixed thereto adapted to project



over the other of said portions and adjacent to a side wall of said other portion when said portions are secured together.

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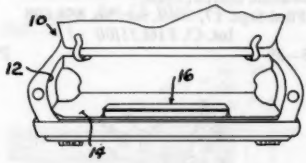
**3,655,216**
**VEHICLE STABILIZER**
**Carlos R. Watts, 1149 S.E. 20, Oklahoma City, Okla.**
**Filed July 31, 1970, Ser. No. 60,017**
**Int. Cl. B60r 27/00**
**U.S. Cl. 280—150 D** **5 Claims**



A vehicle stabilizing apparatus for connection with an automobile, or the like, for reducing the vehicle skidding and dampening vibration. An elongated casing having closed ends is transversely mounted on the automobile. The casing contains a mass of inertia of less length than the case and freely movable between its ends. Resilient means interposed between the respective ends of the case and the mass transfer a force, produced by the inertia of the mass resisting lateral movement of the case to the respective end of the case in a direction opposite the direction of lateral movement of the automobile.

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**3,655,217**
**SAFETY DEVICE FOR VEHICLES**
**James T. Johnson, Herrin, Ill., assignor to Olin Corporation**
**Filed Sept. 18, 1969, Ser. No. 858,978**
**Int. Cl. B60r 21/08**
**U.S. Cl. 280—150 AB** **5 Claims**

A safety device for protecting the occupant of a vehicle including an inflatable bag member and a container for storing fluid under pressure. A propellant charge is also included for producing a hot gas upon the ignition thereof to raise the pressure in the container to rupture a rupturable disc to permit the propellant gas and fluid to escape into the bag member and cause the inflation thereof.

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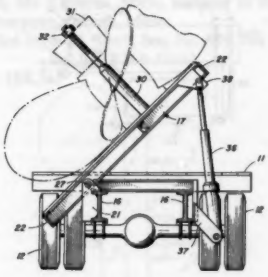
**3,655,218**
**APPARATUS FOR TRANSPORTING HEAVY OBJECTS**
**Louis Dale Taylor, 624 Park Avenue, Freehold, N.J.**
**Filed May 19, 1970, Ser. No. 38,665**
**Int. Cl. B60p 7/08**
**U.S. Cl. 280—179** **5 Claims**



An articulated flat bed trailer for transporting large, bulky objects such as ships propellers and the like. The flat bed of the trailer includes a hinged portion hydraulically rotatable from the horizontal position to an angle of approximately 55°–35° < ⅜ from the horizontal to minimize simultaneously horizontal and vertical overhang of the object. Means are provided to maintain the center of gravity of the rotated flat bed portion - object combination within safe limits.

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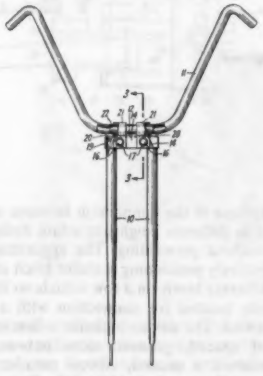
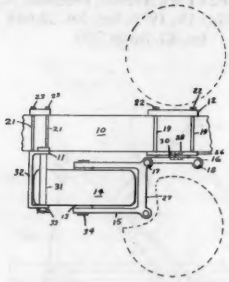
**3,655,219**
**ADJUSTABLE TWIN-STRUT HANDLEBAR CONSTRUCTION**
**William F. Jacoby, Little Rock, Ark., assignor to AMF Incorporated**
**Filed Aug. 28, 1970, Ser. No. 67,777**
**Int. Cl. B62k 21/12**
**U.S. Cl. 280—279** **3 Claims**



Handlebar construction in which a triangular shaped bracket and clamps are used to connect a separate handlebar to twin-struts.

**3,655,220**
**SPARE WHEEL CARRIER FOR SUPPORTING TONGUE OF TRAILER**
**Leonard R. Rodgers, P.O. Box 267, Pittsfield, Pa.**
**Filed Apr. 7, 1970, Ser. No. 26,239**
**Int. Cl. B60s** *9/02*
**U.S. Cl. 280—475** **2 Claims**



This specification discloses a spare wheel and tire carrier for a trailer. The carrier is made in such a way that the trailer wheel may be used as a tongue truck or ground engaging wheel supporting the trailer tongue for use in parking the trailer. The wheel is supported in an especially efficient manner.

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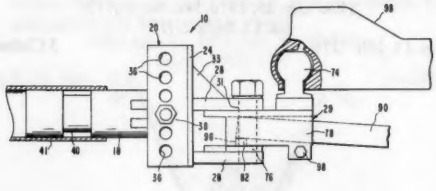
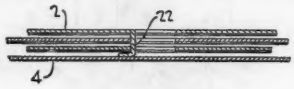
**3,655,221**
**ADJUSTABLE TRAILER HITCH**
**Richard E. Warner, 1530 Edgewood Drive, Lodi, Calif.**
**Filed Jan. 26, 1970, Ser. No. 5,447**
**Int. Cl. B60d** *1/02*
**U.S. Cl. 280—490** **9 Claims**



Apparatus for use in the connection between two vehicles for adjustment to different heights to attain desired levels of each vehicle without prewelding. The apparatus includes a device for selectively positioning a trailer hitch at any one of a number of different levels on a tow vehicle so that the hitch can be properly located for connection with a hitch on a trailer to be towed. The device includes a first member having a pair of spaced, grooved sides between which is removably received a second, ribbed member removably received between the grooved sides of the first member. Pin means is used to connect the first and second members together, the sides of the first member extending up and down so that the second member can be received at different heights above the ground.

**3,655,222**
**MANIFOLD FORMS**
**William R. Wakeman, Niagara Falls, N.Y., assignor to Moore Business Forms, Inc., Niagara Falls, N.Y.**
**Original application May 28, 1968, Ser. No. 732,597, now Patent No. 3,558,159. Divided and this application May 1, 1970, Ser. No. 33,854**
**Int. Cl. B41l** *1/26*
**U.S. Cl. 282—11.5 A** **1 Claim**



This invention provides a new way of attaching carbonless copying sheets in layered assembly, each sheet except one outer sheet having a coating on one side. The attachment is by adhesive applied to an uncoated surface of one outer sheet and the joining of it with an uncoated surface of the other outer sheet by an appropriate structure to get a secure adhesive bond to hold the sheets in assembled relationship.

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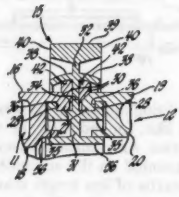
**3,655,223**
**CASING JOINT**
**Douglas Johnson, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.**
**Filed Sept. 17, 1969, Ser. No. 858,698**
**Int. Cl. F16l** *35/00*
**U.S. Cl. 285—39** **29 Claims**



A gas turbine engine casing is joined at circumferential split lines by coupling members formed as rings having flanges which interlock with flanges on the casing sections to hold them against separation and having flanges which are deformed to bear directly or indirectly against the outer surface of the casing to hold the first flanges in engagement. The coupling ring as provided includes a third flange which provides an abutment or reaction surface for a tool which deforms the second flange. A heat shield may be provided on the coupling ring. If a gap between the ends of the ring is necessary for fitting, this is closed by a plug or key on which an internal head is formed by exertion of radial force. The flange on the ring or key against which the force reacts may be removed after the joint is completed. The same sort of joint may be provided at axial or other split lines. The deformed flanges may be pressed against teeth on the casing sections to provide a positive anti-torque connection.

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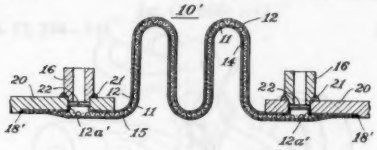
**3,655,224**
**MULTI-PLY BELLOWS STRUCTURE WITH FLUID PERVIOUS SPACER**
**John L. Carberry, Memphis, Ind.; David C. Carson, Sr., and Edward F. Harrington, both of Louisville, Ky., assignors to Chemetron Corporation, Chicago, Ill.**
**Filed May 6, 1969, Ser. No. 822,166**
**Int. Cl. F16l** *35/00*
**U.S. Cl. 285—93** **2 Claims**

A bellows structure adapted to be connected between two parts of a fluid conduit system to serve as a flexible and ex-

pansible joint including a multi-ply bellows element having concentric inner and outer plies each of which is comprised of a flexible circumferentially corrugated thin-walled tube of fluid impervious material, the outer one of the plies having one or more ports therethrough communicating with space



between the plies and adapted for connection therewith of means for monitoring or controlling fluid pressure or flow in the space, and spacer structure in the form of a fluid pervious screen-like meshwork positioned in the space between the plies affording passages for flow of fluid through the space to or from the port or ports.

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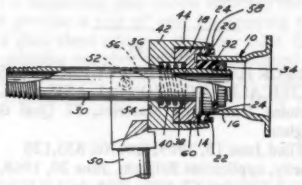
**3,655,225**

## HOT TEST CONNECTOR FOR INTERNAL COMBUSTION ENGINES

**Harry Major, 23135 Blackstone, Warren, Mich.**

**Filed June 25, 1970, Ser. No. 49,649**
**Int. Cl. F16l** *37/20*
**U.S. Cl. 285—311** **9 Claims**



A Hot Test Connector for Internal Combustion Engines to prevent inadvertent blow-off and thus danger to workers in the area in the form of an external retention ring which is mechanically locked onto a connector neck of the engine against any pressure blow-off by a manual locking motion which also provides a seal internally of the connector neck for a water tube which carries water to the engine. The device includes one embodiment for a constant pressure lock which adapts to certain connector necks and a modification for a dimensionally controlled lock for other connectors.

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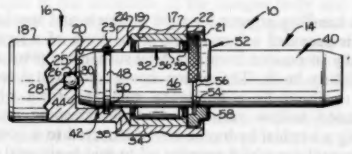
**3,655,226**

## BEARING ASSEMBLY

**Lee R. Cowan, Gastonia, N.C., assignor to C.R.C. Industries, Gastonia, N.C.**

**Filed Aug. 3, 1970, Ser. No. 60,691**
**Int. Cl. F16b** *7/00*
**U.S. Cl. 287—119** **6 Claims**



A bearing assembly for axially and radially supporting a rotatable shaft, and wherein the bearing may be easily removed and replaced. The assembly includes a housing having a socket mounting an annular roller bearing, and a shaft having one end adapted to enter the socket and be radially supported by the roller bearing. The hosing mounts a ball bearing at the inner end of the socket which is adapted to engage the forward end wall of the shaft to axially support the same. A resilient annular ring cooperatively engages annular grooves positioned on the shaft and in the housing wall in the socket to form a quick disconnect coupling for releasably connecting the shaft in the socket.

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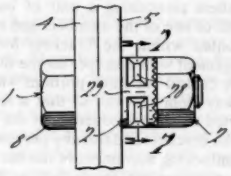
**3,655,227**

## TENSION STRESSED STRUCTURE

**John F. Orloff, Mt. Clemens, Mich., assignor to Huck Manufacturing Company, Detroit, Mich.**

**Filed Sept. 22, 1969, Ser. No. 859,786**
**Int. Cl. F16b** *39/02*
**U.S. Cl. 287—189.36F** **1 Claim**



An improved multi-part fastener for a stressed structure comprising a bolt, a special nut, and an intermediate bushing like element assembled with the bushing between the nut and the opposite end of the bolt, which is applied by crimping the bushing to effect an elongation thereof into an interlocking relationship with the bolt and the nut and also where the bushing is of a softer material than the nut which gives longer life to the installation tool while at the same time maintaining the predictably uniform and high clamping force of the fastening.

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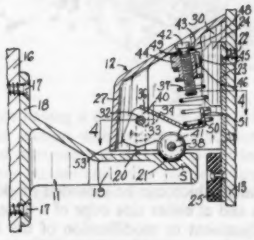
**3,655,228**

## DOOR STOP AND HOLDER

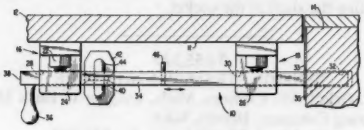
**Leo Coopersmith, Ivoryton, and Frank H. Woodman, Jr., Brandford, both of Conn., assignors to The H. B. Ives Company, New Haven, Conn.**

**Filed July 23, 1970, Ser. No. 57,512**
**Int. Cl. E05c** *19/04*
**U.S. Cl. 292—79** **2 Claims**



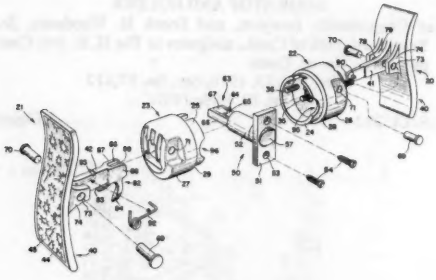
This disclosure relates to a door stop and holder of the type wherein a roller member carried on one of a door and stationary member is adapted to be received within a detent slot on the other of the door and stationary member. The detent slot is defined in an arcuate path and the longitudinal periphery of the roller is formed with an arcuate shape to permit relative placement of the members for varying reveals of the door.

3,655,229
SECURITY BAR LOCK ASSEMBLY
Barney Tumbiolo, 994 Little E. Neck Road, West Babylon, N.Y.
Filed May 22, 1970, Ser. No. 39,616
Int. Cl. E05c 1/04
U.S. Cl. 292—148 6 Claims



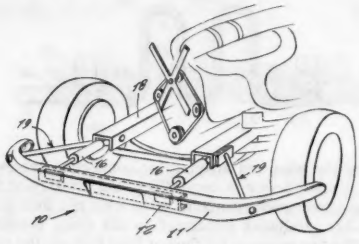
A security lock assembly for securing relatively movable closure members comprising a pair of bar guide brackets fixed on a wall of one of the members and a reciprocable bar slidably mounted within the brackets for movement into locking engagement with a keeper on the other member. The brackets have central bar guide portions which space the bar outwardly away from the wall so that a removably padlock may be inserted through an opening in the bar for abutment with one of the brackets and thereby prevent unauthorized or inadvertent unlocking movement of the bar from the keeper. A limiting stop pin projects inwardly from the bar toward the wall to prevent complete withdrawal of the bar from the bracket as it is moved to its unlocking position.

3,655,230
DOOR LATCH
Richard James Armstrong, Toronto, Ontario, Canada, assignor to Decalock Limited
Filed Sept. 25, 1970, Ser. No. 75,353
Claims priority, application Canada, Oct. 14, 1969, 064,775
Int. Cl. E05b 7/00, 9/08; E05c 1/14
U.S. Cl. 292—169 12 Claims



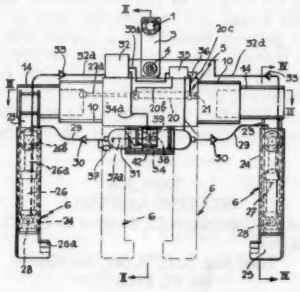
A door latch which can be mounted on doors of different thicknesses and at either side edge of a door without requiring any adjustment or modification of the latch includes a pair of pivotally mounted handles, each of which has a stem which extends inwardly into an opening provided in the door. A cam member is operatively associated with a latch bolt disposed in a passage extending from a side edge of the door inwardly therefrom and such cam member is in turn operatively associated with another cam member which undergoes generally translational movement within the door when either of the handles is pivoted about its pivot axis, each such axis being disposed generally parallel to the latch bolt passage.

3,655,231
IMPACT BUMPER
John Francis Killea, Jr., 145 Bennington Parkway, Franklin Park, N.J.
Filed Mar. 30, 1970, Ser. No. 23,874
Int. Cl. B60r 19/08
U.S. Cl. 293—86 1 Claim



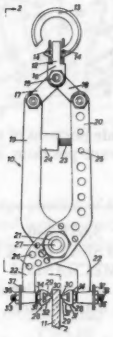
A bumper for an automotive vehicle, the bumper having self contained means for absorbing an initial shock upon impact of the vehicle against another object, the impact bumper including a bumper mounted upon hydraulic cylinders or pneumatic cylinders which permit the bumper to retract without transmitting the initial shock directly to the remainder of the vehicle.

3,655,232
GRIPPER FOR HANDLING HEAVY PRODUCTS AND SPECIFICALLY HORIZONTAL-AXIS COILS
Ghislain Antoine Jean-Marie Martelee, 71 Quai de Rome, Liege, Belgium
Filed June 13, 1969, Ser. No. 833,120
Claims priority, application Belgium, June 20, 1968, 14,803
Int. Cl. B66c 1/66
U.S. Cl. 294—67 R 3 Claims



In a handling gripper for rigid products and specially coils there is provided a framework in the form of a rigid casing pivotally suspended from a vertical suspension pivot attached to a lifting hook. The casing houses horizontal telescopic arms operated by a horizontal ram and from which are suspended hollow vertical telescopic grasping arms each housing a vertical hydraulic ram connected to a compressed oil accumulator which supplies oil to said horizontal ram and to a rotating ram about the vertical suspension pivot, according to the position of a remotely controlled electromagnetic valve.

3,655,233
**TONGS FOR SUSPENDING GLASS SHEETS**
Douglas Twist, Hollywood, near Birmingham, England, assignor to Pilkington Brothers Limited, Liverpool, England
Filed Feb. 5, 1970, Ser. No. 8,958
Claims priority, application Great Britain, Feb. 14, 1969, 8,254/69
Int. Cl. B66c *1/48*
U.S. Cl. 294—118 1 Claim



Tongs for supporting glass sheets vertically during thermal treatment provide a pair of jaws for gripping the opposed faces of a glass sheet adjacent its upper edge. Each jaw includes a gripping member having an elongated knife-edge, the knife-edges being directed towards each other for gripping engagement with the opposed faces of the glass sheet.

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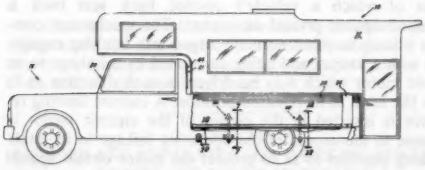
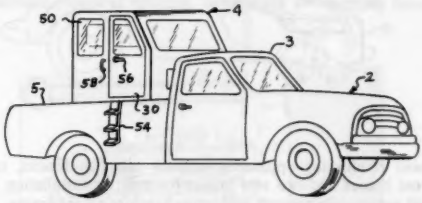
3,655,234
**APPARATUS FOR MOUNTING CAMPER BODY ON A PICKUP TRUCK**
Larry E. Kirschbaum, 3200 Summit Vista, Des Moines, Iowa
Filed Oct. 28, 1970, Ser. No. 84,627
Int. Cl. B62d *21/14*
U.S. Cl. 296—23 MC 12 Claims



Apparatus for mounting a camper body to the bed of a pickup truck which includes attaching one or more rigid runners or rails to the underside of the camper body and securing to the bed of the pickup truck a corresponding number of longitudinally arranged and secured tracks. By registration of the front of the runners or rails in the camper with the rear end portion of the tracks on the truck bed, the camper is guided into proper position as the truck is backed up. Suitable securing means are provided to anchor the tracks to the rails and auxiliary securing means are provided for further securing the camper body to the pickup truck frame. Registering rails and tracks may also be used relative to the top of the sideboards on the truck and the portion of the camper body that extends across such sideboards.

3,655,235
**PASSENGER COACH FOR PICK-UP TRUCKS**
Leonard W. Gray, 3414 Bryan Way, Louisville, Ky.
Filed Apr. 30, 1970, Ser. No. 33,349
Int. Cl. B60p *3/38*
U.S. Cl. 296—23 MC 7 Claims




Conventional pick-up trucks can accommodate only three passengers. The so-called crew cab pick-up trucks have two seats and four doors. These trucks have room for six passengers, but it is impossible to convert from one to the other when additional cargo space is desired. Trucks in which the cargo bed is adapted for carrying passengers are known but these have uncomfortable seating arrangements with passengers either riding sideways, or riding with inadequate leg room. A passenger coach is provided herein for pick-up trucks which enables the passengers to sit in a front facing passenger car seat with adequate leg room. The coach is supported by the truck sides and it extends above the truck cab so that the passengers can see the road ahead.

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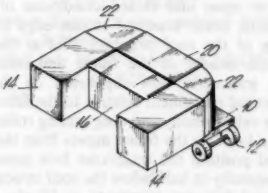
3,655,236
**MOBILE HOME**
Betty J. Hair, Long Beach, Calif., assignor to The Lee Raymond Organization, Inc., New York, N.Y., a part interest
Filed Dec. 31, 1970, Ser. No. 103,121
Int. Cl. B60p *3/34*
U.S. Cl. 296—23 F 4 Claims



A mobile home having a central inner section disposed in an outer central section with inner end portions disposed within outer end portions and secured to the inner central section. The inner section and outer portions can be moved with respect to the outer sections and inner portions to expand the structure.

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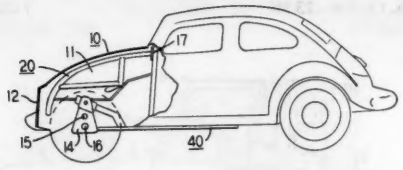
3,655,237
**REINFORCING APPARATUS**
James Arnold Pitman, 1114 Indiana Hill Road, Toms River, N.J.
Filed Sept. 25, 1970, Ser. No. 75,624
Int. Cl. B62d *21/00*
U.S. Cl. 296—28 R 7 Claims

Upper and lower reinforcing apparatus is disclosed in which the upper reinforcing apparatus includes a strut

framework adapted for installation in the forward luggage compartment of a rear engine driven automobile and the



lower reinforcing apparatus includes two pan braces, two cross braces and two arm braces for exterior installation on said automobile beneath said upper reinforcing apparatus.

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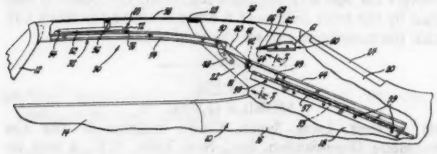
**3,655,238**

## RETRACTABLE CLOSURE

**Ted Stewart, Royal Oak, Mich., assignor to General Electric Corporation, Detroit, Mich.**

**Filed Dec. 2, 1970, Ser. No. 94,493**
**Int. Cl. B60j *7/10***
**U.S. Cl. 296—107** **3 Claims**



A retractable closure for a vehicle body having a roof structure extending over only a portion of the passenger compartment, the retractable closure including a frame bodily movable between extended and retracted positions corresponding to open and closed conditions of the vehicle body, a flexible cover attached at one edge thereof to the leading edge of the roof structure, and at the other edge thereof to the header of the frame and intermediate the edges to a transverse bow supported on the frame for generally vertical movement relative to the latter, and a cam guide on the vehicle body and cooperating roller follower attached to the bow. As the frame moves from the extended to the retracted position the transverse bow causes folding of the cover generally in half below the roof structure while the cam guide and follower cooperate to lift the folded cover into juxtaposition with and under the roof structure to maximize passenger head room.

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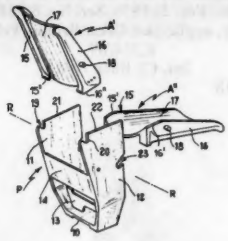
**3,655,239**

## CHAIR HAVING IDENTICAL AND INTERCHANGEABLE SEAT AND BACKREST

**Ettore Agosti, 4 Via Cappuccini, Milan, Italy**

**Filed Sept. 5, 1969, Ser. No. 855,485**
**Claims priority, application Italy, Sept. 12, 1968, 21131 A/68; 9906 B/68**
**Int. Cl. A47c *1/02, 15/00, 1/12***
**U.S. Cl. 297—331** **9 Claims**

There is disclosed a backrest chair for use in providing seating arrangements in rooms, particularly conference rooms, cinemas, theaters, concert halls and similar rooms and which chair includes a support base adapted to be secured to the floor of such a room, such support base including a pedestal portion and two side portions, and a backrest and a folding seat of practically identical construc-



tion so secured to said side portions of said support base as to be adjustable into different positions of use relative to said support base.

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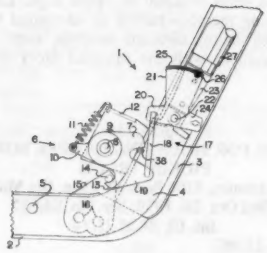
**3,655,240**

## MOTOR ACTUATED SEAT BACK LATCH RELEASE MECHANISM

**Gideon A. DuRocher, Mount Clemens, and Michael B. Kosowan, Allen Park, both of Mich., assignors to Essex International, Inc.**

**Filed July 20, 1970, Ser. No. 52,331**
**Int. Cl. B60n *1/06***
**U.S. Cl. 297—379** **4 Claims**



A motor actuated mechanism for releasing the latch by means of which a vehicle's pivoted back seat back is restrained against pivotal movement. The mechanism comprises a latch member normally urged into latching engagement with a keeper and being connected by a linkage to an electric motor which may be driven in such direction as to move the latch to its released position. A current limiting resistance is inserted in the circuit of the electric motor in response to movement of the operating linkage to its latch-releasing position so as to protect the motor circuit against electrical overload. Spring means is operable to restore the latch and linkage to their latching positions automatically in response to deenergization of the motor circuit.

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**3,655,241**

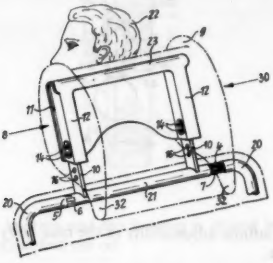
## ADJUSTABLE HEAD REST FOR VEHICLES

**Kurt Herzer, Karlsruhe am Durlach, and Wolfgang Mertens, Karlsruhe, both of Germany, assignors to Kurt Herzer, Karlsruhe am Durlach, Germany**

**Filed Nov. 24, 1969, Ser. No. 879,398**
**Claims priority, application Germany, Apr. 30, 1969, P 19 22 086.1**
**Int. Cl. A47c *1/10***
**U.S. Cl. 297—408** **9 Claims**

An angularly and vertically adjustable head rest which is secured to a back rest of a motor vehicle seat. The heat rest

may be immobilized in a desired height position by locking mechanism disposed entirely within and surrounded by the foam plastic cushion of the head rest. For height adjustment a first locking mechanism may be released by lateral pressure



applied against one edge portion of the head rest and for tilting adjustment a second locking mechanism may be released by pressure applied to the opposite side edge of the head rest.

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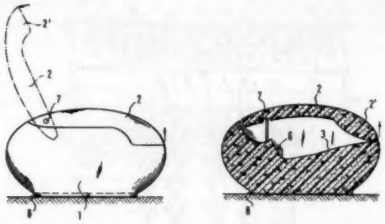
**3,655,242**
**CHAIR**

**Peter Ghyczy, Stettiner Str. 6, 2844 Lemfoerde, Hannover, Germany**

**Filed Dec. 11, 1969, Ser. No. 884,223**
**Int. Cl. A47c** *7/00, 7/14*
**U.S. Cl. 297—445** **6 Claims**



A chair having a back adapted to fold over the seat portion of the chair and thereby impart a generally ellipsoidal shape thereto is made from cellular plastic materials and is especially adapted for use out of doors.

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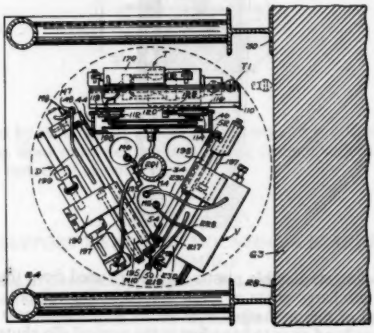
**3,655,243**
**METHOD AND APPAPATUS FOR WORKING MINERAL BODIES AND OTHER MATERIALS**

**Ralph A Fletcher, Bedford, and Joseph R. Oliver, Lowell, both of Mass., assignors to H. E. Fletcher Co., Westford, Middlesex County, Mass.**

**Continuation-in-part of application Ser. No. 793,348, Jan. 23, 1969, now Patent No. 3,558,191. This application Jan. 13, 1970, Ser. No. 2,489**
**Int. Cl. E21c** *37/02*
**U.S. Cl. 299—15** **10 Claims**

Multiple tool means for working a material are mounted in a tool-supporting structure. The tool-supporting structure, at one side, is formed with an elongated tool opening to provide for movement of a gang of tools therethrough into and out of engagement with a surface and the body of the material. Each of the tools in the gang may thereafter be selectively actuated. Where desired, greater versatility is realized by mounting additional reciprocating tools in spaced relation around a frame which revolves through an extended arc of travel. Indexing movement of the revolving frame permits any of the tools to be located so as to be advanced and retracted through the said opening of the tool-supporting structure in various positions of angularity along the extended arc of travel.

In one desirable form of tool means, multiple wedging forces are exerted to split minerals and other bodies along extended planes of splitting. Specifically the wedging forces



may be applied to a mineral body such as granite as it occurs in a natural state, and from which pieces of dimensioned stone may be produced. Controlled splitting is accomplished by a gang of spaced, reciprocating wedge devices together with fluid power-actuated driver means for transmitting driving forces to each of the wedge devices The wedge devices may be operated simultaneously or separately of one another and the driving forces may be exerted to reach a maximum intensity instantly or applied with gradually increasing intensity.

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**3,655,244**
**IMPACT DRIVEN TOOL WITH REPLACEABLE CUTTING POINT**

**James A. Swisher, Easton, Conn., assignor to International Tool Sales, Inc., Bridgeport, Conn.**

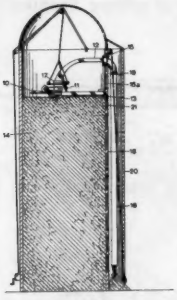
**Filed July 30, 1970, Ser. No. 59,438**
**Int. Cl. E21c** *37/26*
**U.S. Cl. 299—91** **8 Claims**

The shaft and replaceable cutting point of an impact driven tool utilize half an ellipse as the outline of both the external cross-sectional configuration of the driving end of the shaft and the internal cross-sectional configuration of the recess in the tip. The tip is frictionally retained on the shaft driving end for effecting a driving connection therewith.

## 3,655,245
## SILO UNLOADER DISCHARGE TUBES

Harold W. Schumacher, Route 2, De Soto, Wis.

Filed Aug. 27, 1970, Ser. No. 67,401
Int. Cl. B65g *53/40*
U.S. Cl. 302—59 1 Claim



An elongate flexible plastic tube suspended from the end of the discharge chute of a silo unloader. The tube fits over the end of the discharge chute and is attached thereto by a collar or band so as to hang free in the vertical silo chute.

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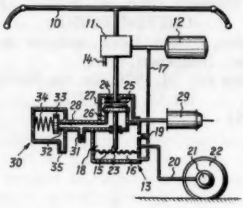
## 3,655,246
## ANTI-SLIP DEVICE FOR COMPRESSED AIR BRAKES, PARTICULARLY FOR RAIL VEHICLES

Siegfried Keller, Effretikon, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG, Zurich, Switzerland

Filed Feb. 20, 1970, Ser. No. 13,021
Claims priority, application Switzerland, Feb. 28, 1969, 3025/69
Int. Cl. B60t *8/12*
U.S. Cl. 303—21 F 1 Claim



The invention relates to an anti-slip device for compressed air brakes, particularly for rail vehicles. An anti-slip device for compressed air brakes, particularly for rail vehicles, in which air is admitted to the brake cylinder through a pipe connected to an air reservoir and the brake cylinder is exhausted to atmosphere through an exhaust pipe incorporating a relay valve and a holding valve which closes the exhaust pipe at a prescribed minimum pressure.

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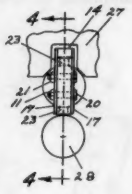
## 3,655,247
## RECIRCULATING BEARING

Robert Raymond Grover, R.F.D. #1, Winchester, N.H.

Filed Feb. 26, 1970, Ser. No. 14,447
Int. Cl. F16c *29/06*
U.S. Cl. 308—6 C 5 Claims

A recirculating anti-friction bearing having a cylindrical race body floatingly mounted on roller members which have an annular radial concave recess centrally thereof thereby



providing infinite adjustability of the race body about its axial center line.

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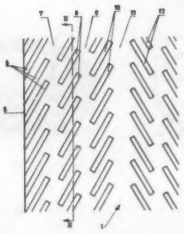
## 3,655,248
## BEARINGS AND SEALS WITH A GROOVED BEARING SURFACE

Gilles Gerardus Hirs, Pijnacker, Netherlands, assignor to Nederlandse Organisatie Voor Toegepast-Nathuurweten-Schappelijk Onderzoek Ten Behoeve Van Nijverheid, Handel En Verkeer, The Hague, Netherlands

Filed July 20, 1970, Ser. No. 56,254
Claims priority, application Netherlands, July 22, 1969, 6911255
Int. Cl. F16c *35/00*
U.S. Cl. 308—9 4 Claims



In bearings and seals comprising a grooved surface for the dynamical generation of back pressure in the lubricant film, the effect of the grooves is considerably less than proportional to the breadth of the bearing or seal if the breadth to diameter ratio is in the usual range of 0.5 to 2 or more. The proportional relationship is restored by composing each groove of two or more separated shorter grooves. At the same time the grooves' tendency of transporting pollutions in the lubricant into the gap and collecting them there, is suppressed.

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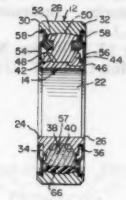
## 3,655,249
## PACKAGE SLEEVE BEARING

Martin L. Abel, 25235 Canterbury, Franklin, Mich.

Filed Jan. 30, 1970, Ser. No. 7,032
Int. Cl. F16c *9/06*, *33/66*
U.S. Cl. 308—72 20 Claims

A self-contained, hydrodynamically lubricated, package sleeve bearing having inner and outer races similar to the inner and outer races of ball bearings. The outer race is rotatably journaled on the inner race by a plurality of arcuate

aluminum bearing elements. A wicking material impregnated with a special oil for lubricating aluminum bearing surfaces is packed in the bearing and the bearing is closed in a way to contain and recirculate the oil.



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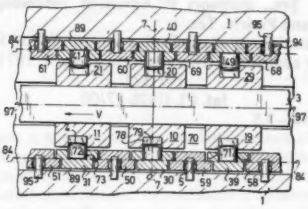
**3,655,250**
**THRUST BEARING**

**Walter Sprenger, Wiesendangen, Switzerland, assignor to Brown-Boveri-Sulzer Turbomachinery, Ltd., Zurich, Switzerland**

**Filed July 21, 1970, Ser. No. 56,898**
**Claims priority, application Switzerland, July 31, 1969, 11728/69**
**Int. Cl. F16c** *17/06*
**U.S. Cl. 308—160** **14 Claims**



The rockers are pivotally mounted in the middle on a pair of rollers and a pin so as to move tangentially of the shaft collar within the annular groove. The supporting bars are formed with one protuberance on one side and a pair of like protuberances on the opposite side so as to have a three point bearing on the rollers. The thrust bearing is thus able to avoid self-locking when deflected during operation.

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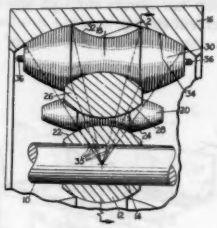
**3,655,251**
**ELLIPTICAL ROLLER BEARING**

**Christopher B. Evenson, Loran Route, Box 151, Cottage Grove, Oreg.**

**Filed July 15, 1970, Ser. No. 55,063**
**Int. Cl. F16c** *23/08, 19/40*
**U.S. Cl. 308—183** **3 Claims**

A roller bearing assembly employing a plurality of elliptical roller bearings in surface contact and arranged to provide improved alignment in a race assembly. In an exemplary assembly, an inner race on a shaft has a convex surface and a first elliptical roller bearing has a concavity intermediate its ends having a radius equal to the radius of the curvature of the race for rolling contact therewith. The concavity of the first elliptical bearing has rolling contact with the convex or profile surface of a second elliptical roller bearing operating on an axis parallel with the axis of the first roller bearing but spaced outwardly therefrom. The assembly also includes a third elliptical roller bearing which operates on an axis parallel with the others and which has a peripheral concavity intermediate its ends. This latter concavity has a radius equal to the profile radius of the second roller bearing and is engaged by such convex surface. The convex or profile surface of the third roller bearing is in rolling contact with the concave surface of an outer race.



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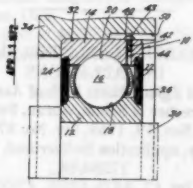
**3,655,252**
**SUPPORT MEANS FOR MOUNTING A BEARING ASSEMBLY**

**William J. Crecelius, Springfield, Pa., assignor to SKF Industries, Inc., King of Prussia, Pa.**

**Filed Jan. 13, 1971, Ser. No. 106,087**
**Int. Cl. F16c** *35/06*
**U.S. Cl. 308—236** **4 Claims**



The combination comprising means for mounting a rolling bearing assembly in a housing or the like, said rolling bearing assembly comprising inner and outer ring members spaced apart to define an annular space, said rings having confronting circumferentially extending raceways for a plurality of rolling elements, means defining a pocket in the housing, means defining an opening extending through one of said rings, a locking screw member having a generally cylindrical shank and an enlarged head, said shank having at least one helical projection, said locking screw member being of a material having a hardness less than the hardness of said one ring whereby upon insertion of the shank into said opening said helical projection is deformed to seat the locking screw member in place and seal said opening, the head of said screw member projecting into the pocket in said housing to prevent relative rotation of said one ring in said housing.

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**3,655,253**
**ARTICLE OF FURNITURE**

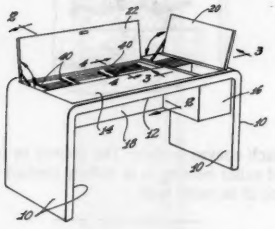
**Douglas Deeds, San Diego, and Barry L. Rosengrant, Los Angeles, both of Calif., assignors to Architectural Fiberglass, Inc., Los Angeles, Calif.**

**Filed Feb. 3, 1970, Ser. No. 8,237**
**Int. Cl. A47b** *17/00, 19/00, 63/00*
**U.S. Cl. 312—194** **3 Claims**

An improved article of furniture is provided which has a double-wall configuration, and which is formed of a sculptured molded fiber-reinforced plastic material. The article of furniture may be in the form of a desk having an inverted U-

shape configuration to form side walls and a top. The desk top may have a depression formed therein for receiving a panel of appropriate material which constitutes the writing surface. An integral well may be formed as part of the article of furniture which has access through the top, and which serves as a convenient storage space.

The molded construction of the article of furniture of the



invention permits monolithic forms to be used in a variety of colors. The desk may be kept clean by means of a damp cloth, for example, without any tendency to metal rusting or paint peeling. The double-wall construction is advantageous in that it permits electrical and electronic equipment to be installed on or into the desk without any unsightly external power cords, leads or other electrical wiring.

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**3,655,254**

**CABINET, PARTICULARLY FOR ELECTRICAL INSTALLATIONS**

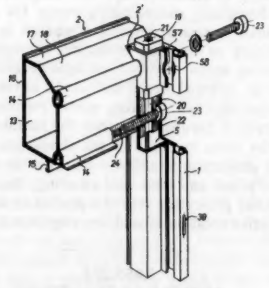
**Georg Mayer, and Egon Glaser, both of Aargau, Switzerland, assignors to Sprecher & Schuh, Aarau, Switzerland**

**Filed Nov. 19, 1969, Ser. No. 878,171**

**Claims priority, application Switzerland, Nov. 20, 1968, 17384/68**

**Int. Cl. A47b** *43/00, 47/00*

**U.S. Cl. 312—257** **6 Claims**



A cabinet, particularly for electrical switchboards and distributing plants, comprises a frame having vertical and horizontal supporting members, the vertical supporting members being formed by hollow section elements preferably consisting of lightweight metal. The transverse horizontal supporting members on the front and rear side of the frame are hollow section elements, and the longitudinal horizontal supporting members are formed by steel T-sections.

**3,655,255**

**ACOUSTIC-OPTIC ULTRASONIC DEVICES USING GERMANIUM CONTAINING CHALCOGENIDE GLASSES**

**John Thorvald Krause, New Providence, and Charles Robert Kurkjian, Somerset, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.**

**Filed July 13, 1970, Ser. No. 54,189**

**Int. Cl. G02f** *1/34*

**U.S. Cl. 350—1** **9 Claims**

Acousto-optic and ultrasonic devices are described which are dependent for their operation on certain germanium-containing compositions of the chalcogenide family of glasses. The acousto-optic devices made from these glasses exhibit high efficiencies when compared to those of devices constructed of earlier materials. The ultrasonic devices exhibit acoustic losses comparable to those of devices made from fused silica.

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**3,655,256**

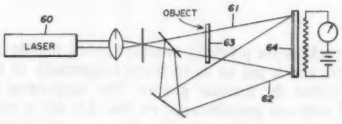
**HOLOGRAPHY WITH THERMOCHROMIC RECORDING MATERIALS**

**Richard N. Claytor, Arlington, and Dayton D. Eden, Dallas, both of Tex., assignors to Advanced Technology Center Inc., Grand Prairie, Tex.**

**Continuation-in-part of application Ser. No. 825,675, May 19, 1969, now abandoned. This application Jan. 4, 1971, Ser. No. 103,397**

**Int. Cl. G02b** *27/00*

**U.S. Cl. 350—3.5** **14 Claims**




Disclosed are methods and apparatus for recording and reproducing optical information in thermochromic materials; exemplary materials are the ternary halides, ternary chalcogenides, and certain transition metal oxides. Methods and apparatus are also disclosed for recording holographic images with infrared radiation and reconstructing infrared holograms in the visible portion of the spectrum.

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**3,655,257**

**APPARATUS FOR FORMING A PHASE HOLOGRAM ON A DEFORMABLE THERMOPLASTIC**

**John C. Urbach, Penfield, N.Y., assignor to Xerox Corporation, Rochester, N.Y.**

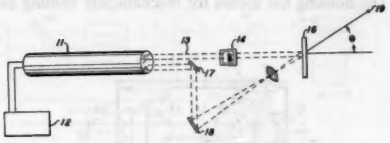
**Original application Jan. 20, 1966, Ser. No. 521,982, now Patent No. 3,560,205. Divided and this application Oct. 6, 1970, Ser. No. 78,536**

**Int. Cl. G02b** *27/00*

**U.S. Cl. 350—3.5** **1 Claim**

Method and apparatus for producing holographic interference patterns wherein a modulated coherent object beam and off axis reference beam cooperate to discharge a photoconductive thermoplastic recording member which is

then recharged and allowed to deform in accordance with the residual charge pattern thereon. The off axis angle is a function of the quasi-resonant frequency of the thermoplastic.



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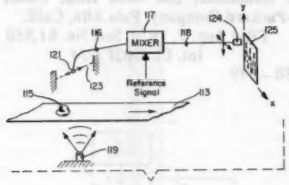
**3,655,258**

## HOLOGRAPHIC IMAGING OF A MOVING OBJECT BY DETECTING RADIATION ALONG A LINE PERPENDICULAR TO THE OBJECT DIRECTION OF TRAVEL

**Bernard P. Hildebrand, Seattle, Wash., assignor to Holotron Corporation, Wilmington, Del.**

**Filed Apr. 20, 1970, Ser. No. 29,784**
**Int. Cl. G02b *27/00***
**U.S. Cl. 350—3.5** **6 Claims**




An object is passed through a radiation beam along a line and resulting object-modified radiation is detected along a line substantially orthogonal to the object direction of travel. In a preferred embodiment, the radiation is ultrasonic energy and at least one ultrasonic radiation transducer (receiver) is repetitively scanned back and forth along this line in the object-modified radiation as the object moves through the illuminating beam. An electrical output from the transducer is compared with a reference signal that is coherent with the object illuminating beam to generate holographic information of the object in the form of an electrical analog signal. This holographic information electrical signal is utilized to form a hologram from which an optical image of the object may be reconstructed. Any aberrations present in the optical reconstructed image are substantially reduced by illuminating the object with a collimated ultrasonic radiation beam.

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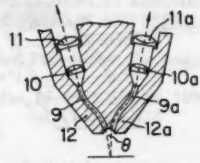
**3,655,259**

## STREOSCOPIC MICROSCOPE WITH GRADED INDEX FIBER OBJECTIVE LENSES

**Tsuneshige Miyauchi, Amagasaki-shi; Jiro Hirano, Hyogo-ken; Atsufumi Ueki; Ryuji Tatsumi, both of Tokyo-to; Kunihiro Mukai, Mie-ken, and Shogo Yoshikawa, Tokyo-to, all of Japan, assignors to Nippon Selfoc Kabushiki Kaisha (also known as Nippon Selfoc Co., Ltd.), Tokyo-to, Japan**

**Filed Aug. 22, 1969, Ser. No. 852,196**
**Claims priority, application Japan, Aug. 24, 1968, 43/60587; Aug. 26, 1968, 43/73377; Sept. 5, 1968, 43/76464**
**Int. Cl. G02b *21/22, 5/14***
**U.S. Cl. 350—36** **5 Claims**

The disclosure relates to an optical image transmitting apparatus adapted for a viewfinder for observation of any object, wherein two systems of transparent structures are provided whose refractive index distribution in each cross section perpendicular to the center axis is reduced nearly in proportion to a square of a distance from the center axis, said transparent structures consisting of rod-like or fibrous substance and being disposed so as to view any article stereoscopically; a viewfinder for medical observation wherein said transparent structures cable of transmitting an optical image therethrough and an optical fiber boundle for transmitting an illumination light to illuminate the article to be the observed are provided in a cavity portion of the inside of a hollow needle such as a hypodermic syringe; a microscope wherein said fibrous transparent structures are used as the object lens; and the like.

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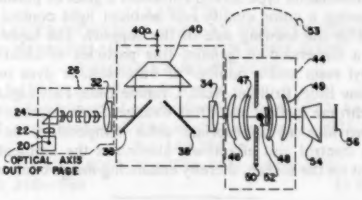
**3,655,260**

## SIMULATOR HAVING AN INFINITE-DEPTH-OF-FIELD OPTICAL PICKUP

**John F. Bartucci, Tallmadge, and James A. Horton, Munroe Falls, both of Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio**

**Continuation-in-part of application Ser. No. 772,960, Nov. 4, 1968, now abandoned. This application July 24, 1970, Ser. No. 58,131**
**Int. Cl. G02b *23/02***
**U.S. Cl. 350—45** **3 Claims**




An optical pickup having a final imaging lens with means for tilting the final lens about its rear nodal point to maintain registration of the optimum image plane resulting from varying object plane orientations. This technique increases the depth of field without affecting the *f*-number of the optical pickup system or introducing distortions.

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**3,655,261**

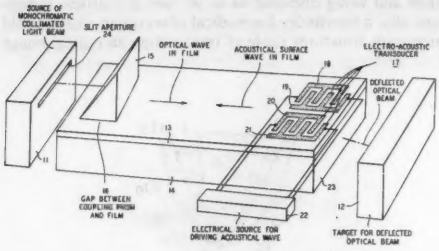
## DEFLECTION OF ELECTROMAGNETIC BEAMS FROM GUIDES BY ACOUSTICAL SURFACE WAVES

**William Shen Chie Chang, University City, Mo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.**

**Filed Mar. 2, 1970, Ser. No. 15,575**
**Int. Cl. G02b *5/14*; G02f *1/34***
**U.S. Cl. 350—96 WG** **1 Claim**

The acousto-optical deflection apparatus disclosed employs acoustical surface waves, typically propagating anti-

parallel to a guided optical beam to deflect the beam out of the guide. In a preferred embodiment, the optical beam is


SOURCE OF MONOCHROMATIC COLLIMATED LIGHT BEAM
SLIT APERTURE
OPTICAL WAVE IN FILM
ACOUSTICAL SURFACE WAVE IN FILM
ELECTRO-ACOUSTIC TRANSDUCER
DEFLECTED OPTICAL BEAM
GAP BETWEEN COUPLING PRISM AND FILM
ELECTRICAL SOURCE FOR DRIVING ACOUSTICAL WAVE
TARGET FOR DEFLECTED OPTICAL BEAM

deflected into a transparent substrate from which it is extracted for utilization.

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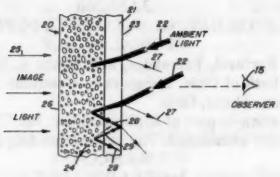
**3,655,262**

## REAR PROJECTION SCREEN

**James J. DePalma, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Sept. 4, 1970, Ser. No. 69,863**
**Int. Cl. G03b** *21/60*
**U.S. Cl. 350—126** **12 Claims**




A transmission type screen embodies a glass or plastic support having a color quality and ambient light control layer applied to the viewing side of the support. The layer comprises a dispersion of gelatin, fine particles of chlorinated diphenyl resin and a number of water-soluble dyes such as Toluidine Blue, Brilliant Acid, Cyanine Blue, Fast Light Red, Superchrome Yellow and Ethyl Orange. Such a screen structure provides an appropriate color temperature or color quality control and effectively eliminates the ambient light incident on the screen, thereby enhancing image contrast.

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**3,655,263**

## LIGHT DIFFUSION DEVICE

**Mark Hoffman, and Claude Alan Lindquist, Jr., both of 253 E. 42nd Street, New York, N.Y.**

**Filed Apr. 20, 1970, Ser. No. 30,272**
**Int. Cl. G03b** *21/60*
**U.S. Cl. 350—126** **6 Claims**

A light diffusion device comprising a transparent resin film having a coating adhered to one surface thereof and comprising the solid contents of a resin lacquer composition containing particulated alumina dispersed therein. A preferred embodiment comprises the use of a saturated polyester resin, both for said film and said lacquer.

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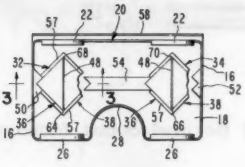
**3,655,264**

## BINOCULAR VIEWING DEVICE

**Theodore C. Pickett, 1104 Stanley Way, Palo Alto, Calif.**

**Filed Sept. 18, 1970, Ser. No. 73,472**
**Int. Cl. G02b** *27/02, 27/24, 5/04*
**U.S. Cl. 350—145** **14 Claims**

A binocular device having a housing provided with a pair of prism assemblies, there being an assembly for each eye, respectively. Each assembly includes a pair of prisms used in the Dove mode with the prisms being disposed with their hypotenuse or long sides in proximity to each other. Spacing means separates the two prisms of each assembly slightly apart. The housing has means for mechanically holding each



prism assembly against relative movement. The prism assemblies are relatively convergent as the forward extremity of the housing is approached. The prism assemblies operate to provide a left-to-right reversal and a fore-to-aft reversal of images of distant and concomitant close-up objects.

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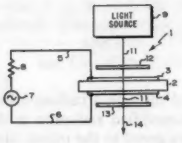
**3,655,265**

## RESONANT PIEZOELECTRIC ACOUSTO-OPTIC LIGHT FILTER AND APPARATUS USING SAME

**Donald L. Hammond, Los Altos Hills, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Aug. 7, 1970, Ser. No. 61,950**
**Int. Cl. G02f** *1/24*
**U.S. Cl. 350—149** **27 Claims**




An acousto-optic light filter is disclosed wherein a radio frequency electric field is employed to excite an acoustic wave in a piezoelectric optically anisotropic medium. The light to be filtered is collinearly diffracted on the acoustic wave to shift light of a first polarization and of a frequency related to the frequency of the acoustic wave, into light of a second polarization. The diffracted light is polarization analyzed to separate light of the second polarization from light of the first polarization. Piezoelectric birefringent crystals are employed for the optically anisotropic medium. Arrays of acoustic resonators are formed by energy trapping in crystalline slabs, such resonators being selectively addressed by applying electric fields to the crystalline slab at the resonant frequency of the selected acoustic resonator. Different overtone resonances of the acoustic resonators are excited to permit the filter to pass light of different frequencies either in time displaced intervals or simultaneously.

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**3,655,266**

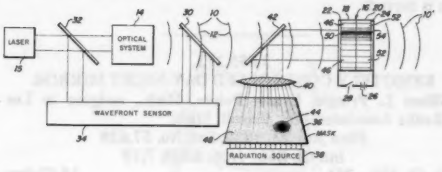
## VARIABLE ELECTRO-OPTIC ELEMENT

**William R. Buchan, Lincoln, Mass., assignor to Itek Corporation, Lexington, Mass.**

**Filed Aug. 31, 1970, Ser. No. 68,265**
**Int. Cl. G02f** *1/20*
**U.S. Cl. 350—150** **22 Claims**

A variable optical device for varying the shape of a wavefront is disclosed including an electro-optic medium whose index of refraction varies as a function of the intensity of an applied electric field and means for applying to that

medium an electric field whose intensity varies in a pattern representative of the spatial variation of the index of refraction of the medium required to vary the shape of a wavefront in some predetermined manner.

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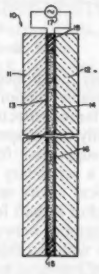
**3,655,267**
**LIGHT VALVES WITH HIGH FREQUENCY EXCITATION**

**Matthew Forlini, Ozone Park, N.Y., assignor to Research Frontiers, Inc., Plainview, N.Y.**

**Filed Apr. 1, 1970, Ser. No. 25,542**
**Int. Cl. G02f** *1/30*
**U.S. Cl. 350—150** **4 Claims**



A light valve having a cell containing a fluid suspension of minute particles dispersed therein capable of orientation by an electric field, has applied thereto an alternating voltage having a frequency at least as high as approximately 325 KHz, and preferably 400 KHz, or higher, to prevent agglomeration of the particles over long periods of use. Generally needle-shaped particles of herapathite may be employed.

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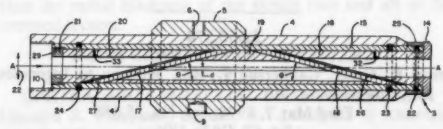
**3,655,268**
**LASER BEAM ATTENUATOR**

**Richard S. Reynolds, Mountain View, Calif., assignor to Sylvania Electric Products Inc.**

**Filed June 1, 1970, Ser. No. 41,900**
**Int. Cl. G02b** *27/28*
**U.S. Cl. 350—152** **2 Claims**



This attenuator comprises a pair of axially aligned antiparallel Brewster angle windows that are rigidly secured in a cylindrical adjustment tube that is rotatably secured in a mounting tube. The attenuation of a linearly polarized laser beam that is incident along the axis of the attenuator is continuously varied from a minimum to a maximum value by rotating the adjustment tube relative to the mounting tube over a 90° angle.

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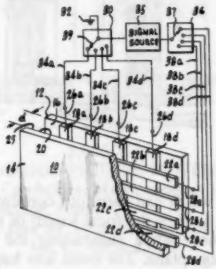
**3,655,269**
**LIQUID CRYSTAL DISPLAY ASSEMBLY HAVING INDEPENDENT CONTRAST AND SPEED OF RESPONSE CONTROLS**

**George H. Heilmeier, Philadelphia, Pa., assignor to RCA Corporation**

**Filed Jan. 25, 1971, Ser. No. 109,688**
**Int. Cl. G02f** *1/28*
**U.S. Cl. 350—160** **5 Claims**




A liquid crystal display assembly offering control of the speed of response of the exhibited electro-optical effect by varying the amplitude of the applied energizing signal and further offering independent control of the contrast by varying the frequency of that signal above a predetermined value.

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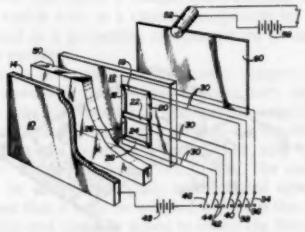
**3,655,270**
**ELECTRO-OPTICAL DISPLAY DEVICES USING NEMATIC MIXTURES WITH VERY WIDE TEMPERATURE RANGES**

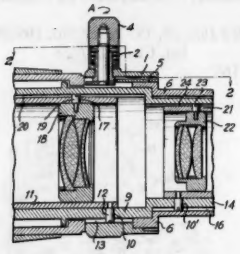
**Linda Truitt Creagh, Route 1, Argyle, Tex.**

**Continuation-in-part of application Ser. No. 67,722, Aug. 28, 1970, now abandoned. This application June 1, 1971, Ser. No. 148,759**
**Int. Cl. G02f** *1/28*; **G09k** *3/00*; **G01m** *31/00*
**U.S. Cl. 350—160** **11 Claims**



A display device wherein a layer of a novel nematic mesomorphic composition that is normally transparent to light scatters light in response to a voltage applied across the composition. The composition consists essentially of a ternary mixture of 4-ethoxybenzylidene-4′-n-butylaniline; 4-methoxybenzylidene-4′-aminophenyl butyrate, and bis-(4′-n-octyloxybenzal)-2-chloro-1,4-phenylenediamine and exhibits the nematic mesophase over a broad temperature range that includes room temperature.

**3,655,271**
**ZOOM LENS FOR NORMAL AND CLOSE-UP PHOTOGRAPHY**
**Yasuo Suzuki, Kashiwa, Japan, assignor to Sun Koki Kabushiki Kaisha, Ichikawa-shi, Chiba-ken, Japan**
**Filed May 11, 1970, Ser. No. 36,243**
**Claims priority, application Japan, May 19, 1969, 44/45269**
**Int. Cl. G02b 7/10**
**U.S. Cl. 350—187** **15 Claims**



A zoom lens which can carry out conventional zoom lens functions so as to vary the focal length of an objective in a continuous manner while maintaining the object in sharp focus at the image plane. The zoom lens has a lens assembly capable of being displaced along the optical axis by a manually operable means. A transmission transmits movement of the manually operable means to a second lens assembly which is also displaced in this way along the optical axis. However, it is possible to disconnect the transmission from the manually operable means, so that while the second lens assembly remains stationary it is possible to move only the first lens assembly by way of the manually operable means. In this way it is possible to utilize the zoom lens, not only for normal zoom lens functions, but also for the purpose of close-up photography.

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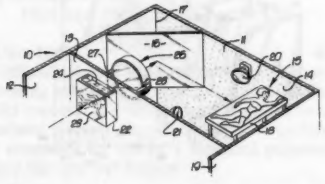
**3,655,272**
**ILLUSION DISPLAY APPARATUS**
**Carlos Valadez, 12800 Moor Park Street, North Hollywood, Calif.**
**Filed Mar. 25, 1970, Ser. No. 22,610**
**Int. Cl. G02b 27/02**
**U.S. Cl. 350—235** **9 Claims**



The display apparatus includes two adjacent rooms with a partition therebetween having an opening therethrough over which an aquarium is mounted in the display room. An object is located on a pedestal in the other room and is lighted to reflect the light through a lens of spherical sectors having liquid filled cavities to reduce and focus the image of the object in the water of the aquarium giving the object the illusion of being smaller than it is and located in the tank when it is not. Motors are provided to selectively move the pedestal and the aquarium to give the object the appearance of moving through the water or of being in the water as the aquarium is moved.

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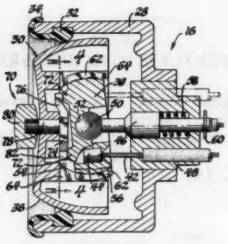
**3,655,273**
**REMOTELY CONTROLLED DAY-NIGHT MIRROR**
**William L. Pringle, Grosse Pointe, Mich., assignor to Lee Radke Associates, Inc., Detroit, Mich.**
**Filed July 23, 1970, Ser. No. 57,628**
**Int. Cl. B60r 1/06; G02b 7/18**
**U.S. Cl. 350—281** **15 Claims**



An improved remotely controlled day-night mirror assembly including a movably supported mirror having two reflecting surfaces of different reflecting power. The actuator means includes a generally cup-shaped housing with a primary actuating member supported for universal movement within the housing and a secondary actuating member supported in a semi-spherical cavity in the primary actuating member and on the head of a shaft for movement relative to the primary actuating member between day and night positions and for movement with the primary actuating member about a common point of universal movement when either in the day or night position for selectively positioning the mirror. The secondary actuating member is connected to the mirror by three push-pull remote control elements. One improved feature resides in connection means comprising tongues and grooves interconnecting the primary and secondary actuating members for only allowing movement of the secondary actuating member relative to the primary actuating member in a plane passing through their common point of universal movement. Another improved feature resides in a control cam means operatively interconnecting the primary and secondary actuating members for moving the secondary actuating member between day and night positions relative to the primary actuating member. More specifically, the cam means includes a pair of diametrically opposed protrusions on the secondary actuating member and a cross member secured to the end of a shaft for rotation relative to the primary actuating member so that the cross member engages the protrusions to move the secondary actuating member relative to the primary actuating member.

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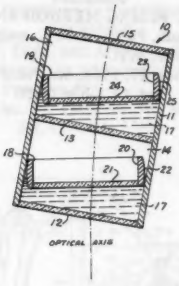
**3,655,274**
**GRAVITY OPERATED LIQUID PRISM**
**Dwin R. Craig, Gaithersburg, Md., assignor to Ingenuics, Inc., Gaithersburg, Md.**
**Filed May 7, 1970, Ser. No. 35,458**
**Int. Cl. G02b 5/06**
**U.S. Cl. 350—286** **2 Claims**

A gravity operated liquid prism attached to an optical system intended for vertical orientation either up or down. The liquid prism includes a floating boat which moves with

the liquid to remain horizontal when the other surface follows the mechanical motion in any direction of its support




thus forming an optical wedge which deviates the optical axis of the system.

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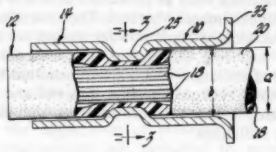
**3,655,275**
**METHOD FOR MAKING FIBER OPTIC ASSEMBLY WITH CRIMPED END CONNECTOR**
**George F. Seagreaves, Warren, Ohio, assignor to General Motors Corporation, Detroit, Mich.**
**Filed Nov. 18, 1970, Ser. No. 90,722**
**Int. Cl. G02b *5/16***
**U.S. Cl. 350—320** **2 Claims**



In a preferred form, this disclosure relates to a fiber optic assembly comprising a fiber optic bundle having an outer flexible sheath of a given external diameter and an end connector crimped onto an end portion of the bundle. The end connector is in the form of a metal sleeve and has a section intermediate its ends which is crimped onto the fiber optic bundle. The section is substantially hexagonal in shape, as viewed in cross section, and has substantially flat sides and apices at the intersection of the sides and with the flats lying on an inscribed circle having a diameter which is less than the external diameter of the sheath whereby the sheath is deformed upon the section being crimped thereon so as to have a radial thickness adjacent the flat sides which is less than the radial thickness of the sheath fore and aft of the crimped section.

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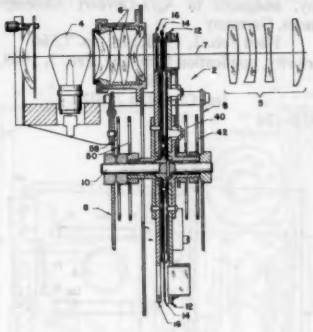
**3,655,276**
**OPHTHALMIC REFRACTING CHART PROJECTOR**
**Leonard A. Wilkinson, Snyder, N.Y., assignor to American Optical Corporation, Southbridge, Mass.**
**Filed Oct. 31, 1969, Ser. No. 873,022**
**Int. Cl. A61b *3/10*; G02b *17/00***
**U.S. Cl. 351—30** **1 Claim**

An ophthalmic refracting chart projector with rotary slide discs having removable slides. Operating controls permit



selective showing of slides in a desired sequence. Astigmatic charts may also be turned on their axes by such control.

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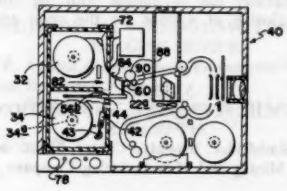
**3,655,277**
**MOTION-PICTURE SYSTEM**
**Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**
**Filed June 20, 1968, Ser. No. 738,464**
**Int. Cl. G03b *23/02***
**U.S. Cl. 352—72** **6 Claims**



Motion-picture apparatus for exposing a motion-picture film especially adapted to a diffusion transfer method of image formation; for rapidly processing the exposed film; and for immediately thereafter projecting the film in the form of a finished motion-picture sequence. The system includes, for an improved operation, a unique multi-purpose cassette or magazine usable both in a camera component for the taking function and in a projection component for processing and projection purposes.

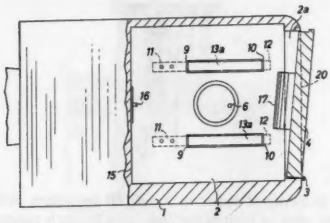
The camera component of the system, adapted to use the aforesaid motion-picture film and cassette, may, appropriately, be of a type also capable of accepting a standard motion-picture film such, for example, as one having the physical characteristics of a so-called "Super-8" film, sold by Eastman Kodak Co., Rochester, New York, U.S.A. The camera may, therefore, be of a substantially conventional type with the qualification that it need be adapted to mount the cassette of the invention and optically suited to utilize the film contained therein.

The projection or viewing component of the system may, suitably, be in the form of a compact cabinet-type unit incorporating a viewing screen comparable in area to that of a television receiver. Such a unit is primarily intended as a home entertainment device but, alternatively, its use may be extended to scientific or other fields where an immediate showing is of advantage following the taking of a motion-picture. The viewing component may also be used for accommodating standard motion-picture film.

## 3,655,278
## MOTION PICTURE CAMERA

Friedrich Winkler, and Johann Zanner, both of Unterhaching, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 2, 1970, Ser. No. 7,566
Claims priority, application Germany, Feb. 7, 1969, G 69 04 668.0
Int. Cl. G03b *23/02*
U.S. Cl. 352—74 12 Claims

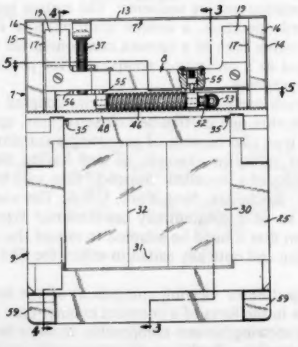


A motion picture camera having a cassette-receiving chamber which extends inwardly from the rear wall of the housing and is flanked by two side walls which converge toward each other in a direction away from the open end of the chamber. One of the side walls carries a coupling which can rotate the reel or reels in an inserted cassette, and a pair of elastic U-shaped springs which flank the coupling and hold the cassette away from the coupling during insertion or withdrawal through the open end of the chamber. A freshly inserted cassette is pivoted toward the one side wall to deform the springs and to engage with the coupling in response to closing of a door for the open end of the chamber.

## 3,655,279
## MICROFICHE SUPPORTING AND POSITIONING APPARATUS

Siegfried F. Rathfelder, Brooklyn Center, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 23, 1968, Ser. No. 786,072
Int. Cl. G03b *23/08*
U.S. Cl. 353—27 4 Claims

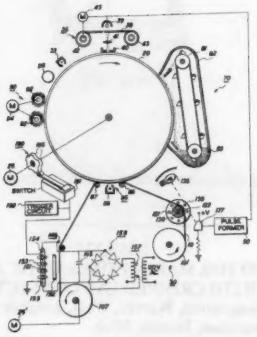


A microfiche supporting and positioning apparatus for use with a reader and/or printer and comprising a plurality of relatively movable frames, one of which supports the microfiche, to readily and precisely position the microfiche at a predetermined position. The apparatus includes means mounting said frames for free-floating movement with respect to each other or for vernier-type movement relative to each other.

## 3,655,280
## XEROGRAPHIC FUSING METHOD AND APPARATUS

Raymond C. Zoppoth, Pittsford, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Nov. 17, 1966, Ser. No. 595,153
Int. Cl. G03g *15/00*
U.S. Cl. 355—3 9 Claims

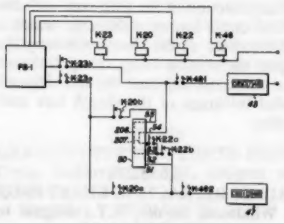


This invention relates generally to xerographic method and apparatus for reproducing information on materials such as photographic film or the like and more particularly to method and apparatus for fusing electroscopic powder images to materials such as processed film and the like having photographic images thereon. The invention is characterized in that electroscopic powder images are fused to film material by exposing the images film material to selected wavelengths of radiation which are transmitted by an optical filter interposed between the film material and an intermittently activated source of short duration high intensity electromagnetic radiations.

## 3,655,281
## BILLING APPARATUS

Larry H. Warren, East Rochester, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Dec. 30, 1969, Ser. No. 889,028
Int. Cl. G03g *15/00*; G06n *7/06*
U.S. Cl. 355—3 6 Claims



A billing system for a xerographic reproducing machine. Large copy sheets fed through the machine will register on a first billing meter. Copy sheets of a smaller size may register the copy on a second billing meter or on the first billing

meter depending on the optical reduction employed. The billing system may be modified so that various combinations of copy sheet sizes and optical reductions may be registered on one of the plurality meters.

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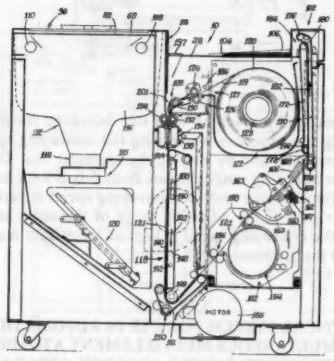
**3,655,282**
**HIGH SPEED PHOTOELECTROSTATIC COPYING MACHINE**

**Charles L. Turner, Elgin, and Arthur S. Zerfahs, Elk Grove, both of Ill., assignors to Addressograph-Multigraph Corporation, Mount Prospect, Ill.**

**Filed Dec. 31, 1969, Ser. No. 889,630**
**Int. Cl. G03g** *15/00*
**U.S. Cl. 355—3** **6 Claims**



A high speed copying machine includes, in combination, a xenon light source for illuminating an original document and providing, via an optical assembly, a light image of the original to an exposure station for imaging copy material as it is transported through the exposure station; a high speed magnetic brush developer for applying toner particles to the imaged copy material at a high rate, and a fusing assembly for fixing the toner particles applied to the copy material thereto by the application of pressure only. Independent transport arrangements are provided to move the copy material through the various copy processing stations of the machine. One of the transport arrangements includes endless belt members each having a piled surface of a non-conductive material to prevent the dissipation of the charge applied to the copy material as the latter is carried by the belt members.

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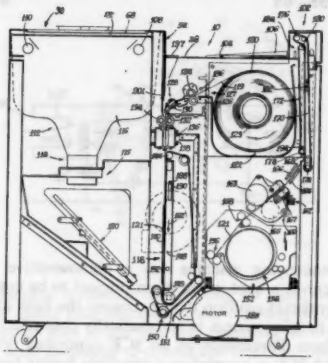
**3,655,283**
**HIGH SPEED PHOTOELECTROSTATIC COPYING MACHINE**

**Harry Margulis, Hoffman Estates, and William B. Miles, Arlington Heights, both of Ill., assignors to Addressograph-Multigraph Corporation, Mount Prospect, Ill.**

**Filed Dec. 31, 1969, Ser. No. 889,629**
**Int. Cl. G03g** *15/00*
**U.S. Cl. 355—14** **20 Claims**

A high speed copying machine for making copies of an original on copy material fed from a roll supply includes cutting, charging, exposing and developing stations disposed along a copy path. A print switch is actuated to operate at least a portion of the copying instrumentalities at the various stations and to initiate the feeding of copy material from the roll supply. A first sensor detects the movement of copy material therepast and in response thereto, discontinues the feeding of copy material from the roll and actuates a cutter in the cutting station to sever a length of copy material. A second sensor detects the movement of the severed copy sheet, and in response thereto, operates an original illuminating source for exposing the copy sheet. Manually resettable jam check circuitry monitors the movement of copy material



along the copy path and inhibits the operation of the machine if a jam occurs. An opening communicating with the copy path receives pre-cut copy sheets to be processed in the machine. Circuitry actuated when processing pre-cut sheets inhibits the operation of the copy roll feed and cutter.

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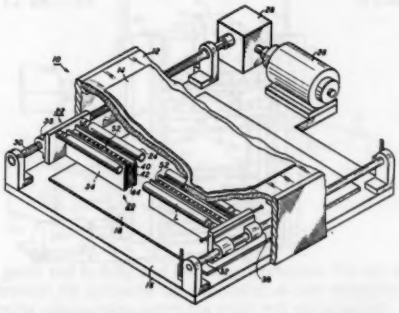
**3,655,284**
**LONGITUDINALLY INSENSITIVE LENS STRIP IMAGING DEVICE**

**Thomas P. Agliata, Rochester, N.Y., assignor to Xerox Corporation, Rochester, N.Y.**

**Filed Mar. 28, 1969, Ser. No. 811,556**
**Int. Cl. G03b** *27/50*
**U.S. Cl. 355—18** **2 Claims**

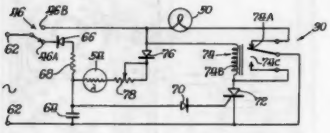


Apparatus for projecting light images from an object towards an image surface. The apparatus includes a plurality of lens strips positioned to project the image at a 1:1 magnification. The first and third lens strips are of a common focal length while the lens strip therebetween is of a focal length half that of the other lens strips. This arrangement renders the apparatus insensitive to its longitudinal position along the optical path.

## 3,655,285
## ILLUMINATION CONTROL FOR PHOTOCOPYING MACHINE

William B. Miles, Arlington Heights, Ill., assignor to Addressograph-Multigraph, Mt. Prospect, Ill.

Filed July 24, 1969, Ser. No. 844,404
Int. Cl. G03b 27/72
U.S. Cl. 355—68 6 Claims

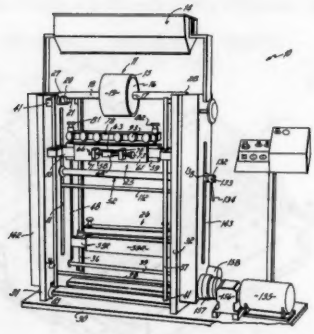


A photocopying machine has a photosensitive surface which receives a light image of an original to be copied. To obtain consistent uniform density copies, the light source or the light imaging system is automatically controlled to provide uniform illumination by an SCR controlled relay. The gate of the SCR is coupled to a capacitor having two charging and/or discharging circuits, one of which includes a light resonsive cell subjected to illumination from the light source. These circuits are sequentially rendered effective by a copy sheet actuated responsive

## 3,655,286
## APPARATUS FOR MANUFACTURING ROTOGRAVURE PRINTING ROLL

Harold C. Thumberger, 1031 Belle Avenue, Hamilton, Ohio

Filed Dec. 15, 1969, Ser. No. 884,839
Int. Cl. G03b 27/22
U.S. Cl. 355—85 18 Claims

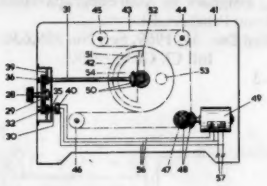


A method and apparatus for generating an etched printing pattern upon a copper jacketed rotogravure roll. The roll is coated with a light sensitive acid resist coating and a photographic positive film is draped over the roll. Rotation of the roll is effected during exposure of the roll to light by pulling one end of the tensioned film away from the roll while lifting the other end toward the roll. The tension of the film is adjusted so that the length of the film images exactly corresponds to the circumference of the roll. The apparatus accomplishes this tension adjustment and roll rotation by controlled movement of the film.

## 3,655,287
## PHOTOCOPYING MACHINE

Theo Pierre Cretien Breuers, Venlo, Netherlands, assignor to Van Der Grinten N.V., Venlo, Netherlands

Filed June 22, 1970, Ser. No. 48,013
Claims priority, application Netherlands, June 24, 1969, 6909654
Int. Cl. G03b 27/04
U.S. Cl. 355—97 3 Claims

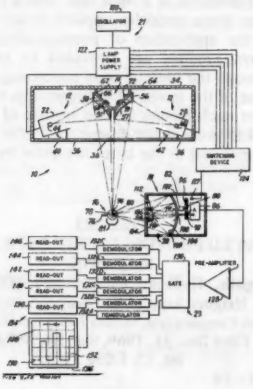


A photocopying machine with one adjusting member for controlling the exposure by varying the conveying speed of the copy material and by varying the luminous flux. During a part of the adjusting range the luminous flux is kept at a constant maximum value and the conveying speed is varied and in another part of the adjusting range of the same adjusting member the conveying speed is kept at a constant maximum value and the luminous flux is varied.

## 3,655,288
## OPTICAL SYSTEM FOR USE IN AUTOMATIC, SIMULTANEOUS MULTIELEMENT ATOMIC SPECTROSCOPY SAMPLE ANALYSIS APPARATUS

Lee M. Lieberman, Fort Lee, N.J., and Robert T. Schumann, Flushing, N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed July 30, 1970, Ser. No. 59,401
Int. Cl. G01j 3/30, 3/48; G01m 21/58
U.S. Cl. 356—87 5 Claims



New and improved optical system for use in apparatus for the automatic, simultaneous multielement analysis of samples by atomic spectroscopy which include a plurality of radiation sources effective to emit radiation of different wavelengths for the irradiation of a sample burner flame are provided, and comprise radiation source optic means including a plurality of toroidal mirrors for reflecting the radiation from said plurality of radiation sources and focusing said radiation sub-

stantially at the same volume of said sample burner flame for irradiation thereof, and detector means optics, including spaced primary and secondary mirrors for observing substantially only said irradiated sample burner flame volume and focusing substantially only the radiation therefrom at the radiation detector.

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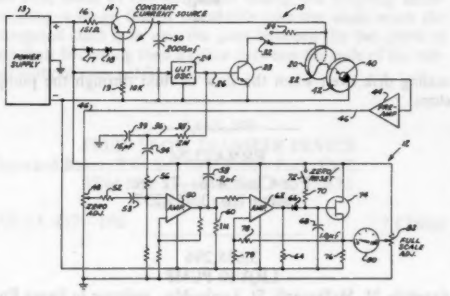
**3,655,289**

## OPACITY METER WITH NOISE SUPPRESSION

**Jimmy Aubrey Walker, Fountain Valley, Calif., assignor to The Susquehanna Corporation, Fairfax, Va.**

**Filed Jan. 22, 1971, Ser. No. 108,821**
**Int. Cl. G01n** *21/06, 21/22, 21/12*
**U.S. Cl. 356—201** **9 Claims**




A system and process are disclosed for measuring the transmittance or opacity of a smoke plume discharged from a smokestack or diesel engine exhaust. Measurement is accomplished by passing light pulses through the smoke plume and detecting the remaining energy with a photoelectric detector. The effect of scattered light is eliminated. An electrical signal proportional to the unabsorbed light received at the detector is displayed on a calibrated opacity meter. The accuracy of the system and process is enhanced by negating or suppressing the effect of noise.

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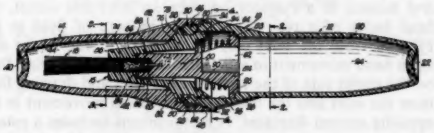
**3,655,290**

## APPLICATOR INSTRUMENT

**Vernon D. Griffith, Wichita, Kans., assignor to Griffith & Associates, Inc., Wichita, Kans.**

**Filed Oct. 2, 1970, Ser. No. 77,660**
**Int. Cl. B43m** *11/06*
**U.S. Cl. 401—186** **10 Claims**



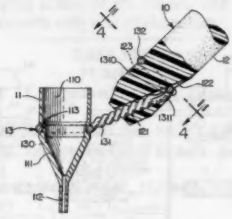
An instrument for applying fingernail polish or the like having shiftable and interrelated parts, which automatically open a fluid passage from a reservoir to a brush element when a cover cap is removed and the main body of the instrument is squeezed, and which automatically close said passage and seal the brush element in a closed zone when the cover cap is emplaced on the main body.

**3,655,291**

## STYLUS FOR WAX WRITING, GOLD SCROLLING AND THE LIKE

**William Volker, 18977 Burt Road, Detroit, Mich.**

**Filed Sept. 21, 1970, Ser. No. 74,094**
**Int. Cl. B43k** *1/06;* **A46b** *11/08*
**U.S. Cl. 401—265** **3 Claims**



An improved stylus for wax writing on eggs, fabric and paper, for liquid gold and other color scrolling on ceramics, and for other uses in the fine arts consisting of a reservoir scribing head including a cylindrical reservoir open at its upper end and formed conical shaped at its lower end terminating in a hollow depending scriber point through which molten wax, liquid gold, india ink or the like flows during contact with the article being scribed when the stylus is in use. The scribing head is secured firmly in spaced relationship to the lower end of a preferably plastic shaft by means of a looped and partially twisted wire extending into and through a diagonal bore in the lower end of said plastic which permits heating of the scribing head for melting wax and scooping it therein whereby to charge the scribing head for wax writing use.

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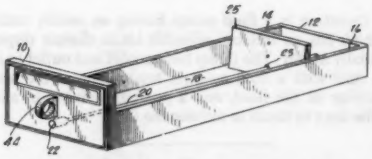
**3,655,292**

## GUIDE ROD LOCKING AND RELEASING MECHANISM FOR FILE DRAWERS

**Robert H. Savage, deceased, late of Schwenksville, Pa. (by Deborah F. Savage, administratrix), assignor to Art Metal-Knoll Corporation, New York, N.Y.**

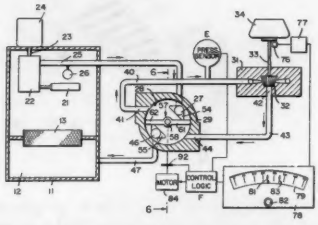
**Filed June 17, 1970, Ser. No. 47,028**
**Int. Cl. B42f** *13/00, 17/16*
**U.S. Cl. 402—63** **8 Claims**



A guide rod locking and releasing mechanism for use with file drawers for apertured sheet material. A cam arrangement of simple construction moves the guide rod out smoothly.

The guide rod is locked in place by a latch plate such that the front end face of the rod is flush with the front face of the drawer front panel. When it is desired to move the rod forward, a single motion of an operating means hidden within the drawer front panel and accessible through the bottom of the front panel moves the latch plate to release the rod and then operates a cam to move the rod forwardly so that the rod protrudes from the front face of the drawer front panel. The guide rod can then be grasped and pulled out to allow removing or adding sheet material.

**3,655,293**
**VARIABLE AND REVERSING HYDRAULIC DRIVE SYSTEM FOR TURBINES**
**John F. Williams, New Canaan, Conn., assignor to Ivan Sorvall, Inc., Newton, Conn.**
**Filed Aug. 11, 1970, Ser. No. 62,846**
**Int. Cl. F01b** *25/00*
**U.S. Cl. 415—17** **12 Claims**



Turbine drive system including a novel hydraulic valve for providing throttling and reversing flow of hydraulic fluid through a turbine drive for a centrifuge rotor or the like. The valve may be controlled automatically by a feedback system from the centrifuge drive shaft for correcting or preventing errors in rotor speed as well as by a feedback system responsive to the pressure variations in the hydraulic supply to the turbine impeller.

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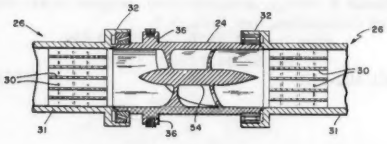
**3,655,294**
**PUMP**
**Robert H. Thatcher, Wichita, Kans., assignor to Marine Systems, Inc., Wichita, Kans.**
**Filed Jan. 19, 1970, Ser. No. 3,757**
**Int. Cl. F01d** *1/24*
**U.S. Cl. 415—68** **15 Claims**



This invention is a fluid pump having an axially rotating duct which has an internal impeller blade therein disposed substantially axially. The pump has an inlet and outlet to couple the duct with a fluid medium functioning as the source and receiver of the fluid, and a powering means to axially rotate the duct to result in moving the fluid.

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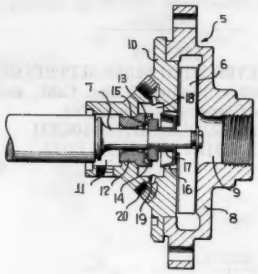
**3,655,295**
**MECHANICAL SEAL FOR CENTRIFUGAL PUMPS**
**William Mitchell, Dover, N.J., assignor to Eco Pump Corporation, South Plainfield, N.J.**
**Filed Oct. 1, 1970, Ser. No. 77,239**
**Int. Cl. F01d** *11/00*
**U.S. Cl. 415—113** **1 Claim**

A mechanical seal for centrifugal pumps having a fixed bearing mounted in the housing of the pump for supporting the shaft of the pump, a rotating sealing disk mounted on the shaft in contact with the fixed bearing, the bearing and sealing disk being surrounded by a cavity formed in the housing and a cup shaped slinger mounted on the shaft between the cavity and impeller of the pump for introducing and retaining fluid in the cavity for lubricating and cooling the bearing and



sealing disk even when the flow of fluid through the pump stops.

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**ERRATUM**

For Class 416—72 see:
Patent No. 3,655,297

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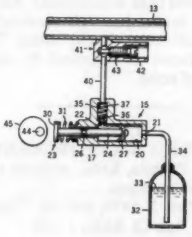
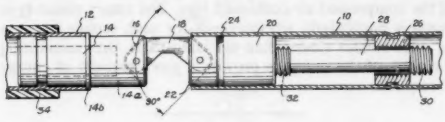
**3,655,296**
**LIQUID PUMP**
**Franklin M. McDougall, St. Louis, Mo., assignor to Dema Engineering Co., St. Louis, Mo.**
**Filed July 18, 1969, Ser. No. 842,910**
**Int. Cl. F04b** *49/00*
**U.S. Cl. 417—214** **2 Claims**



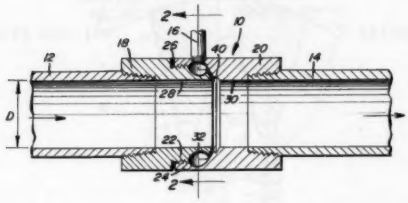
A liquid pump having a piston head carried by a piston rod and located in a cylinder between an inlet and outlet, the head being of a type that enables passage of fluid in the cylinder from the inlet side of the head to the outlet side upon head movement in a first direction, and delivering fluid on the outlet side of the head to the outlet and drawing fluid from the inlet into the inlet side upon head movement in the opposite second direction. A motor means includes a rotatable eccentric engageable with a follower carried by the piston rod to urge the piston means away from one limit of its movement and in the first direction, while a spring tends to return the piston means to said one limit of its movement in the second direction. A check valve communicates with the outlet and enables fluid flow only in the direction from the cylinder through the outlet, and a metering valve means communicates with the outlet and regulates liquid flow delivered by the piston means through the outlet at a predetermined rate.

**3,655,297**
**COUPLING FOR FOLDABLE TUBULAR PARTS**
Hugh R. Bolen, Jr., and Charles S. Wiggins, both of Lexington, Va., assignors to Magnetic Forming Corporation
Filed Nov. 25, 1970, Ser. No. 92,646
Int. Cl. F16c *11/00*
U.S. Cl. 416—72 2 Claims



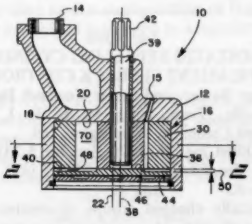
A coupling for the elongated tubular shaft of a paddle, or the like, made of two lengths of tubing, the coupling incorporating a hinge that is retractible into the shaft when the elongated shaft is in use, the joint between the two parts of the shaft becoming then a splice between the ends of the tubing without external fastenings.

**3,655,298**
**FLUID FLOW TRANSFER DEVICE**
Hayward Baker, P.O. Box 887, Menlo Park, Calif.
Filed May 15, 1970, Ser. No. 37,672
Int. Cl. F04f *5/44*
U.S. Cl. 417—196 7 Claims



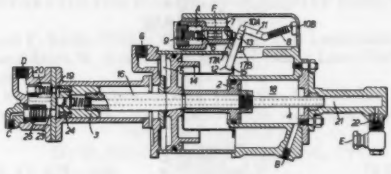
Materials are transported through a conduit by the action of an impelling fluid introduced at a low mass flow rate and high velocity into the conduit. The impelling fluid enters the conduit along the inside wall surface with a velocity vector parallel to the flow path of the conduit for smooth transfer of energy to a compatible carrier fluid under laminar flow conditions.

**3,655,299**
**ROTARY PUMP WITH PRESSURE RELIEF**
Laverne R. Connelly, Marshall, Mich., assignor to Eaton Corporation, Cleveland, Ohio
Filed Nov. 12, 1970, Ser. No. 88,790
Int. Cl. F04b *49/02*
U.S. Cl. 417—310 12 Claims



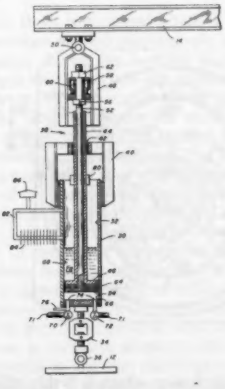
A rotary pump includes a housing, rotors, an inlet chamber, an outlet chamber and pressure relief means. The pressure relief means includes a movable wall normally resiliently biased into engagement with one of said rotors and exposed to fluid pressure at said outlet chamber. At a predetermined maximum pressure, the fluid pressure force acting upon the wall will overcome the resilient bias and move the wall away from said rotors to a degree sufficient to interconnect said outlet and said inlet chambers in fluid communication and allow fluid to flow therebetween and thereby disrupt the pumping action of the rotors. The movable wall pressure relief contacts only one of the rotors.

**3,655,300**
**PUMPS**
Albert H. Davis, 11, Trontbeck, Close, Twyford, Berkshire, England
Filed July 7, 1970, Ser. No. 52,839
Claims priority, application Great Britain, July 8, 1969, 34,410/69
Int. Cl. F04b *17/00, 35/00, 21/04*
U.S. Cl. 417—397 4 Claims



The invention is concerned with an air operated hydraulic pump by which compressed air can be used to provide on the one hand a supply of hydraulic fluid under high pressure for the operation of high pressure hydraulic devices and on the other hand a supply of hydraulic fluid under relatively low pressure at a relatively high rate for rapid action of hydraulic devices under light loads. To that end a pneumatic motor is used to drive two hydraulic pumps in common; one pump is of relatively large displacement and is connected to deliver hydraulic fluid to the inlet of the other pump and therethrough to an outlet, and the pressure in the large displacement pump, and hence the pressure of relatively high rate delivery, is limited to a value low in relation to the maximum pressure of delivery fluid by the second pump stage.

**3,655,301**
**FLUID PUMP**
Clifford F. McClung, 2761 East 45th Place, Tulsa, Okla.
Filed May 28, 1970, Ser. No. 41,319
Int. Cl. F01b *31/04*; F16j *1/06*; F04b *49/00*
U.S. Cl. 417—437 1 Claim



A fluid pump having a piston member reciprocally disposed within a hollow cylinder utilizes the oscillating ac-

tion of an external walking beam as a prime mover thereof. Turnbuckle means secure the cylinder of the compressor to a stationary surface and further provide a means for adjusting the compression ratio. The piston member possesses the ability to compensate for piston ring wear thereby maintaining the piston ring in sealing engagement with the inner wall of the cylinder.

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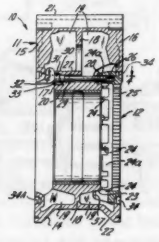
**3,655,302**
**ROTOR AND GEAR ASSEMBLY FOR ROTARY MECHANISMS**

**Walter L. Hermes, Cedar Grove, and Charles Jones, Hillsdale, both of N.J., assignors to Curtiss-Wright Corporation**

**Filed Apr. 2, 1970, Ser. No. 25,220**
**Int. Cl. F01c** *17/02*; **F16h** *51/08*
**U.S. Cl. 418—61** **2 Claims**



An improved rotor and gear assembly for rotary mechanisms, such as combustion engines or the like, in which the gear is seated in one face of the rotor and secured to the rotor by a plurality of circumferentially spaced fastening means extending from the face of the rotor opposite from the gear, through the rotor, into the gear to thereby flexibly secure the gear against radial movement due to thermal distortion resulting from cyclically varying stress loads and thermal induced stresses.

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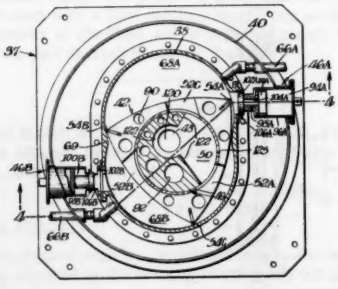
**3,655,303**
**ENERGY ABSORBING ROTARY PISTON PUMP**

**Robert B. Cotton, Media, Pa., assignor to All American Industries, Inc., Wilmington, Del.**

**Continuation-in-part of application Ser. No. 756,035, Aug. 28, 1968, now Patent No. 3,549,110. This application Oct. 28, 1970, Ser. No. 84,825**
**Int. Cl. F01c** *1/02*; **F04c** *1/02, 15/02*
**U.S. Cl. 418—61** **5 Claims**



An energy absorbing device, which is highly effective for use in an aircraft arresting gear, is provided by mounting a rotary pump having a pressure related characteristic within a container of fluid. The pump circulates the fluid from and back into the container whereby it absorbs energy in response to a mechanical input and transmits this energy to the fluid in the container in the form of heat. A highly effective form of this device utilizes a rotary piston-type pump having an axial input channel in its shaft connected to radial passageways extending through its cam disc and rotating piston. The fluid is discharged through pressure relief valves of the compressed air cushioned type. The rotary piston-type pump is particularly advantageous for such service because its rotor rotates slower than the input shaft, thus minimizing the mass of the pump to provide a given amount of energy absorption.

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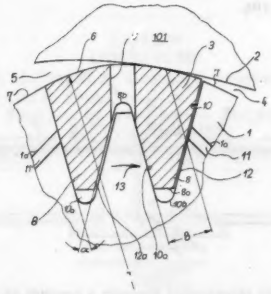
**3,655,304**
**SEALING DEVICE FOR PISTONS OF ROTARY PISTON MACHINES**

**Hans Sturmer, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany**

**Filed Sept. 17, 1970, Ser. No. 73,039**
**Claims priority, application Germany, Oct. 2, 1969, P 19 49 695.8**
**Int. Cl. F01c** *19/02*; **F03c** *3/00*
**U.S. Cl. 418—124** **12 Claims**



A rotary piston machine wherein the piston has several lobes and orbits in the interior of a cylinder whereby its lobes sweep along the inner surface of the cylinder. The lobes are formed with axially parallel grooves bounded by internal surfaces of gear tooth shaped profile, and each groove receives a sealing element whose outer portion has a convex external surface engaging the inner surface of the cylinder and whose inner portion has several gear tooth shaped projections which are received with some clearance in complementary sections of the groove. Channels which are formed in the sealing elements establish communication between the chamber of the cylinder and certain sections of the grooves to insure that all sides the sealing elements are subjected to substantially identical pressures which are only slightly higher than necessary to maintain the sealing elements in requisite sealing engagement with the inner surface of the cylinder.

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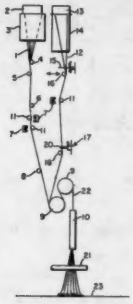
**3,655,305**
**ELECTROSTATIC REPELLING CYLINDERS FOR FILAMENT FLYBACK CONTROL**

**James Fletcher Baxter, and Samir Costandi Debbas, both of Hendersonville, Tenn., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**Filed Jan. 26, 1970, Ser. No. 5,731**
**Int. Cl. D01d** *7/00*; **B65h** *53/00*
**U.S. Cl. 425—83** **2 Claims**

Electrostatically charged groups of continuous filaments entrained in a plurality of gaseous streams are forwarded by means of jet devices toward a receiving area. The tendency

of filaments at the edges of each group to escape from its group and to become attracted to nearby grounded surfaces



is reduced by forming an electrostatic field of the same polarity as the charge on the filaments in the zone between the jet devices and the receiving area.

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**3,655,306**

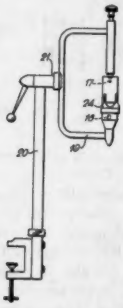
**APPARATUS FOR MOLDING HEART VALVES**

**Donald Nixon Ross, and Derek Barrie Ray, both of National Heart Hospital West Moreland Street, London W.1, England**

**Filed Jan. 19, 1970, Ser. No. 3,749**

**Int. Cl. A61f** *1/22;* **B29d** *31/00*

**U.S. Cl. 425—109** **14 Claims**



The invention relates to an apparatus and method for manufacturing replacement aortic heart valves using tissue taken from a patient's own thigh. The tissue is moulded between first and second complementary surfaces of two complementary forming members, the complementary surfaces corresponding to the configuration of the heart valve. The tissue when moulded is secured to a support.

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**3,655,307**

**ELECTROSTATIC PINNING OF DIELECTRIC FILM**

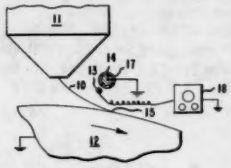
**William E. Hawkins, Circleville, Ohio, assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**Continuation-in-part of application Ser. No. 823,848, May 12, 1969, now abandoned. This application Mar. 23, 1970, Ser. No. 21,695**

**Int. Cl. B29d** *7/22*

**U.S. Cl. 425—109** **9 Claims**

Apparatus for electrostatically pinning a moving dielectric web to a roll which comprises a first electrode and a second,



insulated electrode independent of the roll, and means for establishing a potential difference therebetween.

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**3,655,308**

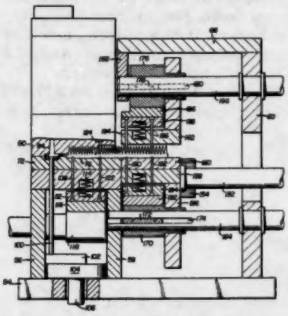
**APPARATUS FOR MAKING PROGRESSIVE INJECTION MOLDED SHEET**

**Louis F. Kutik, 8720 S.W. 23rd Place, Fort Lauderdale, Fla., and Erich W. Gronemeyer, 2100 S. Ocean Lane, Fort Lauderdale**

**Original application May 16, 1968, Ser. No. 729,694, now Patent No. 3,616,110. Divided and this application Apr. 30, 1971, Ser. No. 138,894**

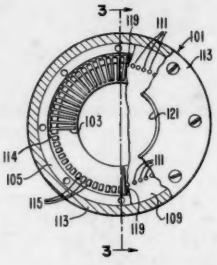
**Int. Cl. B29d** *7/00, 21/00;* **B29f** *1/06, 1/14*

**U.S. Cl. 425—109** **11 Claims**



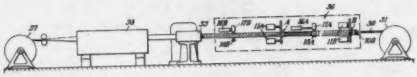
A plastic sheet is disclosed which is made up of injection molded sections molded progressively and joined together at edges thereof during the molding process. The sheet may have integral bristles on one side thereof making it useful as a rug or carpet, buy other uses of the invention are contemplated. The method includes the molding of plastic sections such that as each section after the first one is molded it welds to a previously molded section at an edge thereof, and the sections are advanced after each molding step so that a trailing edge of the last molded section seals the mold exit. The trailing edge may be provided with a thin flange which is softened by the molten material so that a weld is formed. Shrinkage of the plastic is controlled to prevent leakage of molten plastic from the mold around the last molded section and also to prevent buckling of the sheet. This is preferably done by providing keys in the mold which harness the plastic to the mold. Pins in the mold are used to form indentations in the sections to facilitate advancing the sections. Other pins slightly oversize in diameter and length serve as a lock for accurate alignment of the sections and also serve a sealing purpose.

**3,655,309**
**ROTATING FIXTURE-MOLD FOR FABRICATING PRINTING DRUMS**
**Neal Hepner, Birmingham, Mich., assignor to Burroughs Corporation, Detroit, Mich.**
**Original application Nov. 15, 1967, Ser. No. 690,041, now Patent No. 3,529,054, dated Sept. 15, 1970. Divided and this application Mar. 13, 1969, Ser. No. 806,829**
**Int. Cl. B29d *3/00*; B29c *5/04***
**U.S. Cl. 425—109** **9 Claims**




A rotating fixture-mold for locating and holding type bearing print members in a spatical relationship to each other and to the axis of rotation of the fixture mold. The type bearing print members when molded together form a drum structure which may be used as a printing drum or as an intermediate mold.

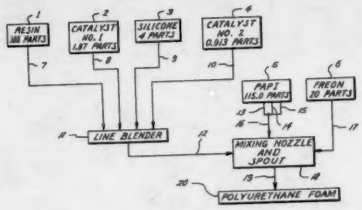
**3,655,310**
**MANUFACTURE OF HOSE PIPES**
**Brian Lawrence Smith, Hornby, near Lancaster, and Rodger William Robertson, Halton-on-Lune, near Lancaster, both of England, assignors to George Angus & Company Limited, Newcastle-upon-Tyne, England**
**Filed June 30, 1969, Ser. No. 837,676**
**Claims priority, application Great Britain, Aug. 16, 1968, 39,280/68**
**Int. Cl. B29f *3/10***
**U.S. Cl. 425—109** **5 Claims**



The invention provides mechanism for feeding a textile jacket along a rearward extension of the mandrel of an extrusion head which applies to the jacket a cover and a lining of rubber or plastics material, said mechanism including two spaced clamps which are operable alternately to clamp the jacket to the mandrel extension and to hold the latter against forward movement, two feed mechanisms one of which operates while the front clamp is engaged to feed the portion of the jacket between the clamps forwardly along the mandrel extension, and the other of which operates while the rear clamp is engaged to feed forwardly along the mandrel extension the portion of the jacket in advance of the clamps and an automatic control circuit for effecting sequential operation of the clamps and the feed mechanisms.

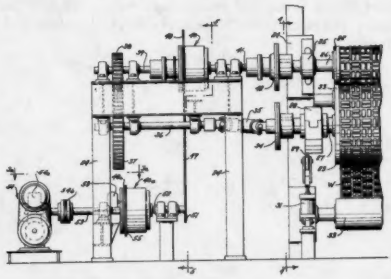
**3,655,311**
**APPARATUS FOR PRODUCING ISOTROPIC FOAMED SYNTHETIC RESIN STOCK**
**Lawrence Christie Porter, Palos Verdes Peninsula, Calif., assignor to The Upjohn Company, Kalamazoo, Mich.**
**Continuation of application Ser. No. 579,053, Sept. 13, 1966. This application May 13, 1970, Ser. No. 37,421**
**Int. Cl. B29d *27/04***
**U.S. Cl. 425—115** **12 Claims**

This invention relates to the production of cellular synthetic resin stock, and more particularly relates to methods and apparatus for producing foamed synthetic resin stock, especially polyurethane foam, having a substantially




rectangular cross section and which is generally isotropic in character.

**3,655,312**
**APPARATUS FOR MAKING EMBOSSED FOAMED SURFACE COVERING MATERIALS**
**Edward R. Erb, Geryville, and Richard L. Maass, Salisbury Township, Lehigh County, both of Pa., assignors to GAF Corporation, New York City, N.Y.**
**Filed May 2, 1969, Ser. No. 821,409**
**Int. Cl. B31f *1/00***
**U.S. Cl. 425—115** **8 Claims**

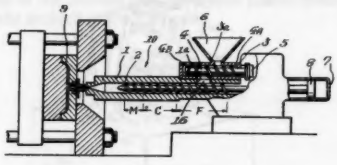


Surface covering materials such as foamed vinyl floor coverings are manufactured by applying a foamable resin layer to a base or substrate, printing a pattern on the foamable layer, applying a transparent wear layer over the printing, heating the product to develop the foam, and then passing the foamed product through an embossing nip formed between a backing roll and an embossing roll, the latter having lands and valleys conforming with the printed pattern. The product is pulled through the embossing nip by drive means located beyond the embossing and backing rolls, the product being retained in sufficient surface contact with the backing roll to effect rotation of the backing roll without slippage, and the embossing roll is driven from the backing roll through a transmission providing for variation in the peripheral surface speed of the embossing roll to maintain registration of the lands and valleys of the embossing roll with the printed pattern.

**3,655,313**
**PLASTIC INJECTION MOLDING APPARATUS**
**Mahito Kunogi, Nagoya, Japan, assignor to Meiki Seisgkusho, Ltd., Nagoya City, Aichi-ken**
**Filed June 3, 1970, Ser. No. 43,019**
**Claims priority, application Japan, June 13, 1969, 44/47085; Sept. 4, 1969, 44/70229; Apr. 11, 1970, 45/31025**
**Int. Cl. B29f *3/00***
**U.S. Cl. 425—130** **9 Claims**

An injection molding apparatus is provided characterized by having an injection screw rod rotatably and reciprocably

mounted in a heating cylinder, there being a channel between the thread convolutions on the screw rod, and a portion of that channel correspondingly in the metering zone of the screw rod being shallow in depth within limits prescribed by empirical formula so as to have the screw rod efficiently constrain against backflow of molten plastic material on injection stroke, and there further being drive means and feed means interrelated in the apparatus for the feed means to supply raw plastic material to the screw rod in a feed zone of the latter at a rate commensurate with power demanded of the drive means for rotating the screw rod to feed raw plastic material forwardly from the feed zone being within practical limits.



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**3,655,314**

**SPINNING APPARATUS COMPOSED OF MODULAR SPINNING UNITS ON COMMON HEATING BEAM**

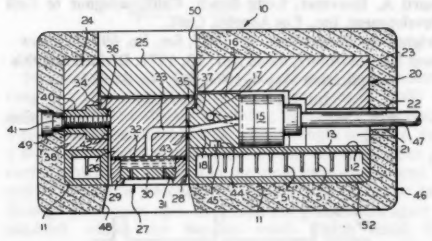
**Erich Lenk, Remscheid-Lennep, and Theodor Krawszik, Remscheid, both of Germany, assignors to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany**

**Filed Feb. 17, 1970, Ser. No. 11,954**

**Claims priority, application Germany, Feb. 19, 1969, P 19 08 207.6**

**Int. Cl. D01d** *3/00, 5/08*

**U.S. Cl. 425—131** **10 Claims**



Elongated spinning beam with elongated, hollow heating member of flat, L- or U-cross section having removable mounted thereon a plurality of side-by-side melt spinning units, each having block-like units of pumps, spinning nozzle packs, and melt-conveying connecting units; interposed block-like members with melt distribution lines including stopcocks for supplying melt along the beam to respective pumps; and upper heat-conductive distributor plates or bars above the pumps and nozzle packs for uniform heat distribution within an encapsulating, heat insulating jacket.

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**3,655,315**

**HYDRAULIC CYLINDER APPARATUS**

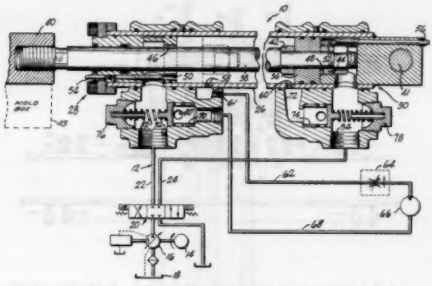
**Cecil W. Bopp, Waterloo, Iowa, assignor to Go Corp. Inc., Adrian, Mich.**

**Filed Feb. 2, 1970, Ser. No. 7,570**

**Int. Cl. B28b** *13/02*

**U.S. Cl. 425—145** **7 Claims**

A feed drawer cylinder assembly for a concrete block molding machine. The assembly is constructed and arranged in association with the hydraulic circuit for the agitator motor of the machine to open a circuit to the motor in timed relation to movement of the cylinder piston to a discharge position of the feed drawer. The cylinder assembly is also constructed to provide improved deceleration characteristics of the piston at each end of its stroke during normal cushioning of the piston in the cylinder.



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**3,655,316**

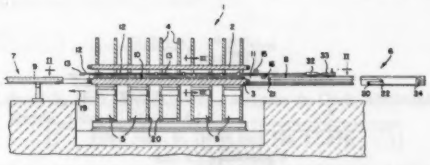
**UNLOADING MECHANISM FOR SINGLE-LEVEL PLATEN PRESS**

**Walter Husges, Krefeld, Germany, assignor to G. Siempelkamp & Co., Krefeld, Germany**

**Filed Feb. 17, 1970, Ser. No. 11,972**

**Int. Cl. B30b** *15/32*

**U.S. Cl. 425—161** **9 Claims**



A conveyor tray, insertable from one side between two press platens for the deposition of a pile of particulate material to be bonded under heat and pressure to form a board, is mounted on a horizontally slidable frame which also carries inwardly swingable suction arms for gripping a finished board and discharging it from the press at the opposite side while a new pile is delivered by the conveyor tray.

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**3,655,317**

**AUTOMATIC MOLD STRIPPING MACHINE**

**Harold F. Funkhouser, and Charles W. Daugherty, both of Xenia, Ohio, assignors to Baxter Laboratories, Inc., Morton Grove, Ill.**

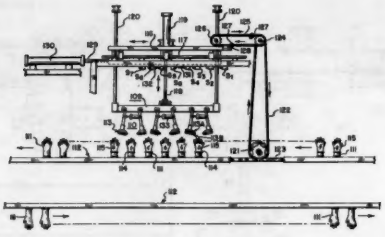
**Filed Feb. 26, 1970, Ser. No. 14,424**

**Int. Cl. B29c** *13/04;* **B29h** *3/044*

**U.S. Cl. 425—165** **12 Claims**

A machine for automatically stripping thin, flexible molded products from their molds on a continuously moving conveyor comprises, in essence, a movable array of arm pairs for clamping onto the molds, each arm having a pair of fingers for clamping onto a cuff or bead at the bottom of the molded product. The array of arms is attached to a movable carriage on a track parallel to the conveyor. A pneumatically actuated piston rod raises and lowers the array. Mechanical drive means are provided for engaging the carriage when the arm pairs are centered over the molds and for driving it at the

same speed at the conveyor. As the carriage moves, it activates a series of switches which lower the array, clamp the arms onto the molds, clamp the fingers onto the beads,



spread the arms again, and raise the array. A shuttle platform is driven under the raised array, and the stripped products are released. The carriage and the shuttle are then returned to their initial positions for a repetition of the cycle.

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**3,655,318**

**APPARATUS FOR FILLING AND COMPACTING A MIX INTO A FORM FOR MAKING PRECAST ELEMENTS**

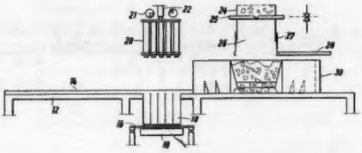
**Wolfgang Schneider, Mushardweg 8, and Klaus Schneider, Feldweg 18, both of 2150 Buxtehude, Germany**

**Filed Nov. 21, 1969, Ser. No. 878,682**

**Claims priority, application Germany, Nov. 21, 1968, P 18 10 128.5**

**Int. Cl. B28b** *13/02*

**U.S. Cl. 425—218** **7 Claims**



Mass production of small precast concrete elements is improved with regard to uniformity of dimensions and of concrete compactability by a novel method and apparatus for filling the concrete mix into the form and compacting the mix in the form. According to the invention the form is evenly filled with a premetered quantity of concrete mix and any surplus due to inhomogeneities in the mix is removed during compacting of the concrete.

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**3,655,319**

**CLAY-WARE SHAPING MACHINE WITH ADJUSTABLE TOOL SUPPORTING MEANS**

**Arthur Bradshaw, and Frank William Meadows, both of Stoke-on-Trent, England, assignors to Service (Engineers) Limited, Cobridge, Stoke-on-Trent, England**

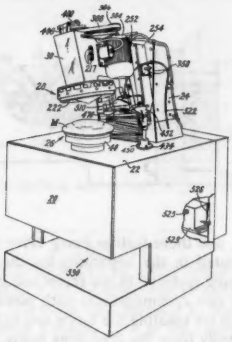
**Filed Mar. 3, 1970, Ser. No. 16,233**

**Claims priority, application Great Britain, Mar. 7, 1969, 12,067/69**

**Int. Cl. B28b** *1/02*

**U.S. Cl. 425—267** **10 Claims**

An improved machine for producing ceramic flatwear by shaping clay pieces to a plaster mould carried on a rotatable mould support using a roller shaping tool. The improvement which reflects itself in increased production is obtained by inclusion of means for raising the mould support to a uniform



height in successive operating cycles of the machine and means for providing vertical adjustment of the tool with respect to the mould during operation of the machine.

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**3,655,320**

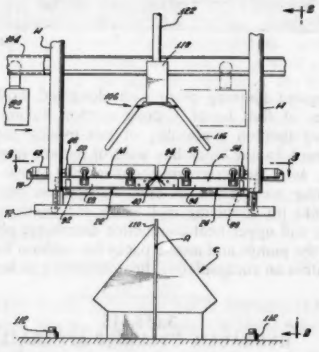
**VACUUM MOLDING MACHINE FOR ANGULATED CAVITY FORM**

**Edward A. Heavener, Long Beach, Calif., assignor to Gulf Development, Inc., Los Angeles, Calif.**

**Original application Dec. 20, 1967, Ser. No. 692,193, now Patent No. 3,574,807, dated Apr. 13, 1971. Divided and this application May 4, 1970, Ser. No. 34,085**

**Int. Cl. B29c** *17/02, 17/04*

**U.S. Cl. 425—388** **9 Claims**



Sheet material to be formed over the angulated cavity form C (FIGS. 1 and 2) is clamped on a frame F. The frame F and

preheated sheet M are lowered by hydraulic motors H. Abutments A engage the lowering frame F and cause it to fold about the angulated form (FIGS. 4*a* and 4*b*) progressively to effect seals along side flanges S of the form (FIG. 2) and ultimately to form seals along the end flanges E by an overdraw. Vacuum is then applied. The depth of draw is minimized; the wall thickness is substantially maintained to achieve substantial strength in the finished part; very little plastic material is wasted as the molded part is trimmed.

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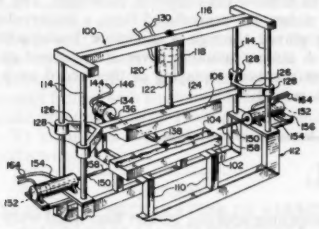
**3,655,321**

## APPARATUS FOR PRODUCING A HOLLOW HAMMER HANDLE WITH LONGITUDINALLY TENSIONED GLASS FIBERS

**Wayne Wolf, Cedar Rapids, Iowa, assignor to Vaughan & Bushnell Mfg. Co., Hebron, Ill.**

Division of Ser. No. 817,805, Apr. 25, 1969
Filed Sept. 22, 1970, Ser. No. 74,447
Int. Cl. B29c *3/00*
U.S. Cl. 425—395 4 Claims



Molding apparatus for the production of two tandem-arranged hollow hammer handles having longitudinally tensioned fiber glass strands extending throughout their length. Upper and lower mold blocks, when brought together, define a mold cavity having open ends. Plastic-saturated fiber glass roving which is positioned in the mold cavity is pierced by a pair of mandrels which are projected into the mold cavity through such open ends to spread the glass fibers apart and establish within the handles voids which result from polymerization of the plastic material in the mold cavity.

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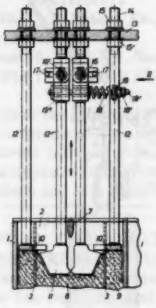
**3,655,322**

## HOLLOW BRICK MOLD BOX

**Walter Kaitna, Vienna, Austria, assignor to Wienerberger Ziegelfabriks-Und Baugesellschaft**

Filed Feb. 24, 1970, Ser. No. 13,665
Claims priority, application Austria, Feb. 25, 1969, A 1909/69
Int. Cl. B28b *7/00*
U.S. Cl. 425—431 5 Claims

Hollow bricks are molded about cores supported by core bars in a mold box. The moldable material in the box is compacted by a pair of vertically movable compaction tools. The core bars are of beveled cross section to form respective vertically extending camming surfaces tapering upwardly and downwardly, and each core bar is centered between the compaction tools of each pair of tools, with one of the camming surfaces facing a respective tool during vertical movement of the tools adjacent the bar. Springs normally reciprocate the



tools of each pair towards each other, the camming surfaces being arranged first to reciprocate the tools apart as the tools vertically move downwardly into contact with the camming surfaces and, upon further downward movement, to permit reciprocation towards each other by the action of the springs.

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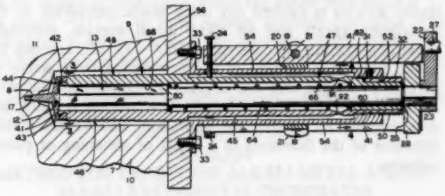
**3,655,323**

## MOLDING DIE STRUCTURE

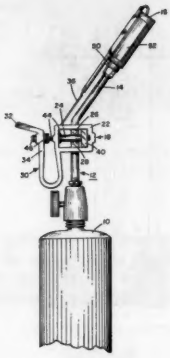
**Leland V. Hall, Riddle, Oreg., assignor to Oasis Electronics, Riddle, Oreg.**

Filed Mar. 9, 1970, Ser. No. 17,379
Int. Cl. B29c *1/06*
U.S. Cl. 425—438 3 Claims



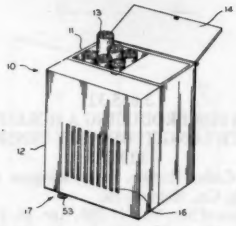
A core to be used for injection molding of or the forming of molded or extruded cylinders whereas they have threaded or otherwise undercut internal surfaces, in which the core die is collapsible enough to allow the molded or extruded part to be ejected from die. The walls of the core are not hinged but are formed from two sleeves which are slotted to form tines or springy segments, all of which are solidly paired together at one end. The segments are locked in place by means of a cam. The cam holds the segments so as to form an extremely solid die wall.

3,655,324
IMPACT TYPE PIEZOELECTRIC MECHANISM
Earl O. Schweitzer, Wickliffe, Ohio, assignor to Vernitron Corporation, Bedford, Ohio
Filed May 18, 1970, Ser. No. 38,233
Int. Cl. F23q 3/00
U.S. Cl. 431—258 18 Claims



An impact type piezoelectric mechanism for use in igniting a gaseous fuel from a torch or a similar device. A piezoelectric element is housed in a plastic-like casing which simultaneously serves as an insulator and which is integrally connected with a U-shaped spring carrying an impact body for manually striking the piezoelectric element.

3,655,325
SMOKING DETERRENT
Lewis R. Toppel, Chicago, Ill., assignor to Topp Ltd., Incorporated, Chicago, Ill.
Filed Mar. 9, 1970, Ser. No. 17,644
Int. Cl. G11b 17/06
U.S. Cl. 274—14 10 Claims



A pseudo-cigarette package that produces simulated coughing sounds when the package is picked up by a potential user to remove the cigarette therefrom. The simulated coughing noises are reproduced from a battery-driven disk recording played through a miniature loudspeaker in the package. A unique actuating lever arrangement enables the almost instantaneous replaying of the record each time the package is moved.

# CHEMICAL

3,655,326
ACETYLATION OF TEXTILE ARTICLES OF CELLULOSE
Andre Rajon, Tassin-la-Demi-Lune, France, assignor to Societe Rhodiaceta, Paris, France
Filed Nov. 5, 1969, Ser. No. 874,366
Claims priority, application France, Nov. 6, 1968, 172765
Int. Cl. D06m 13/20; C08b 3/06
U.S. Cl. 8—121 6 Claims

The heterogeneous acetylation of regenerated cellulose textile articles is carried out using acetic anhydride as the acetylating agents and an alkali metal acetate, especially potassium acetate, as catalyst at 100°–135° C., keeping the acetic anhydride content of the acetylation bath above 95 percent by weight, and also keeping the constituent filaments of the articles at constant length. The process is quick and thus suitable for continuous operation, and avoids mutual cohesion of the filaments as a result of softening or partial solution.

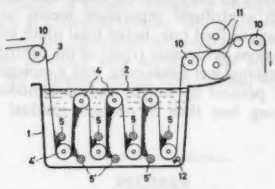
3,655,327
FABRIC PROCESS
William H. Rollins, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.
Continuation-in-part of application Ser. No. 458,955, May 26, 1965, now abandoned. This application Sept. 19, 1969, Ser. No. 871,397
Int. Cl. D06m ; A02g 3/04
U.S. Cl. 8—130.1 13 Claims

A process for imparting stretch characteristics to a woven fabric comprising applying greater than usual warp yarn tension to a fabric in a plurality of increments and then setting the fabric in its new configuration.

3,655,328
PROCESS FOR A LIQUID TREATMENT OF CLOTH
Yoshikazu Sando; Takashi Tsuchihashi, and Hiroshi Ishidoshiro, all of Wakayama-ken, Japan, assignors to Santo Iron Works Co., Ltd., Wakayama-shi, Wakayama-ken, Japan
Filed Dec. 12, 1969, Ser. No. 884,575
Claims priority, application Japan, May 19, 1969, 44/38545; June 16, 1969, 44/47410; Nov. 4, 1969, 44/88320
Int. Cl. B05c 3/152
U.S. Cl. 8—149.1 4 Claims

A process and an apparatus for a liquid treatment of cloth,

such as washing in water, desizing and scouring, in which



numberless foams are fed between guide rollers positioned in a treatment liquor and the cloth is put on the guide rollers.

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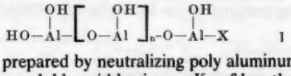
**3,655,329**

## POLY ALUMINUM HYDROXY COMPLEXES AND PROCESS FOR THEIR PRODUCTION

**I-Kao Shih; Eric Blaser, both of, Toronto, Ontario, Canada, assignors to Warner-Lambert Company, Morris Plains, N.J.**

**Filed Jan. 2, 1968, Ser. No. 789,059**
**Int. Cl. C01f *1/00***
**U.S. Cl. 23—50 R** **1 Claim**

A new class of poly aluminum hydroxy complexes of the formula:



which are prepared by neutralizing poly aluminum hydroxide with a water soluble acid having a pKa of less than 5, for example, hydrochloric acid, hydrobromic acid, nitric acid, lactic acid, acetic acid, to obtain poly aluminum hydroxy complex of the formula: PAH—X, in which PAH is poly aluminum hydroxy and X is the anion; the PAH—X thus formed can be treated further with aqueous solution of water soluble salts to make other derivatives. These poly aluminum hydroxy PAH—X) complexes are useful as deodorant, anti-perspirant and astringent agents.

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**3,655,330**

## PROCESS FOR THE PREPARATION OF ALUMINA AND MAGNESIUM ALUMINATE BODIES

**Richard Raymond Rettew, Laurel; David Griffith Wirth, Jr., Wheaton, and Newton Levy, Jr., Ellicott City, all of Md., assignors to W. R. Grace & Co., New York, N.Y.**

**Filed Mar. 12, 1970, Ser. No. 19,121**
**Int. Cl. C01f *7/02, 7/34***
**U.S. Cl. 23—52** **13 Claims**

A process for preparing strong, chemically inert, alpha alumina or magnesium aluminate spinel ($MgAl_2O_4$) bodies. The alpha alumina bodies have densities of greater than 3.92 grams per cc, grain sizes of 2–6 microns and purities in excess of 99.9 percent and are sinterable to fine grain microstructures at temperatures below 1,550° C. The calcination of the alumina or spinel precursor is carried out in a system that carefully controls the rate of temperature rise and that carries out the calcination in the presence of water vapor.

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**3,655,331**

## PRODUCTION OF SODIUM CARBONATE

**Leonard Seglin, New York, N.Y., and Henry S. Winnicki, New Canaan, Conn., assignors to Intermountain Research & Development Corporation, Cheyenne, Wyo.**

**Continuation of application Ser. No. 356,880, Apr. 2, 1964, now abandoned , which is a continuation-in-part of application Ser. No. 72,145, Nov. 28, 1960, now patent No. 3,131,996, which is a continuation-in-part of application Ser. No. 632,236, Jan. 2, 1957, now Patent No. 2,962,348. This application June 6, 1969, Ser. No. 835,878. The portion of the term of this patent subsequent to May 5, 1981, has been disclaimed.**
**Int. Cl. C01d *7/00***
**U.S. Cl. 23—63** **15 Claims**

A process for preparing refined soda ash from crude trona by calcining the crude trona to crude sodium carbonate, mixing the crude sodium carbonate with an aqueous solution containing at least 6 percent of sodium carbonate to form a saturated solution of sodium carbonate, separating the solution from the gangue solids, evaporating the solution to crystallize sodium carbonate therefrom, separating the sodium carbonate crystals and calcining to soda ash.

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**3,655,332**

## PROCESS FOR PREPARING LITHIUM COMPOUNDS OF THE FORMULA $LiMF_6$ WHEREIN M IS ARSENIC OR ANTIMONY

**William Novis Smith, Jr., Exton, Pa., assignor to Foote Mineral Company, Exton, Pa.**

**Filed June 15, 1970, Ser. No. 46,543**
**Int. Cl. C01d *11/02*; C01b *27/00, 29/00***
**U.S. Cl. 23—88** **8 Claims**

Lithium compounds of the formula $LiMF_6$ wherein M is arsenic or antimony are prepared by a metathesis reaction in an inert organic solvent between lithium tetrafluoroborate and an alkali metal compound of the formula $ZMF_6$, wherein Z is potassium or sodium and M is as defined above.

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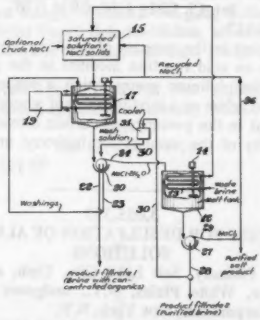
**3,655,333**

## PROCESS FOR PRODUCING ANHYDROUS SODIUM CHLORIDE AND PURIFIED SATURATED BRINE

**Vernon A. Stenger, and Walter R. Kramer, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.**

**Filed May 4, 1970, Ser. No. 34,420**
**Int. Cl. C01d *3/06, 3/14***
**U.S. Cl. 23—89** **6 Claims**



Solid sodium chloride is incorporated into a sodium chloride-saturated brine containing dissolved matter, other than sodium chloride, to be concentrated. The temperature of the system is reduced to within the range from about 0° C. to about −21° C. to form sodium chloride dihydrate. The dihydrate is separated from the aqueous system thereby increasing the concentration of the other dissolved matter relative to the remaining liquid phase. The process is particularly useful for concentrating dilute systems for further treatment or ultimate disposal.

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**3,655,334**

## METHOD FOR PRODUCING ALKALI METAL AND/OR ALKALI EARTH-METAL PHOSPHATES

**Kurt Willi Harri Kribbe, deceased, late of Knapsack near Cologne, Germany (by Gertrude Katharina Kribbe nee Hanhardt, Heinrich Kribbe, Edith Kribbe nee Kuhrt, Heinz Harnisch, Joseph Crener, heirs), assignor to Knapsack-Griesheim Aktiengesellschaft, Knapsack near Cologne, Germany**

**Continuation of application Ser. No. 375,388, June 15, 1964, now abandoned. This application Nov. 17, 1969, Ser. No. 871,521**
**Claims priority, application Germany, July 8, 196 , K 50156**
**Int. Cl. C01b *25/30***
**U.S. Cl. 23—106** **1 Claim**

A process for obtaining alkali metal phosphates by introducing an alkali metal compound into a phosphorus-oxygen flame, the amount of alkali metal compound fed into

the reactor being such that an excess of 1–50 mol percent of $P_2O_5$ is maintained with respect to the ratio of metal oxide to $P_2O_5$ in the final product.

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3,655,335
PRODUCTION OF PHOSPHATES
John A. Peterson, Niagara Falls, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.
Filed Dec. 31, 1968, Ser. No. 789,011. The portion of the term of the patent subsequent to Jan. 14, 1986, has been disclaimed.
Int. Cl. C01b *25/28*, *25/30*
U.S. Cl. 23—107 14 Claims

A process for making pure alkali metal or ammonium phosphates wherein wet process phosphoric acid is treated with iron powder, the acid-iron mixture neutralized with a basic material to a pH of 3.5–9. The resulting slurry is filtered and a pure phosphate product recovered from the filtrate.

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3,655,336
PROCESS FOR THE CATALYTIC PRODUCTION OF HYDROXYL-AMMONIUM SALTS
Heinz Heine, Krefeld, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
Filed Oct. 15, 1969, Ser. No. 866,718
Claims priority, application Germany, Nov. 2, 1968, P 18 06 537.7
Int. Cl. C01g *1/10*; C01c *1/28*
U.S. Cl. 23—117 3 Claims

Improvement in the process of reacting nitric oxide and hydrogen in an acid reaction medium in the presence of a catalyst of the platinum group which is suspended on graphite, active carbon or a mixture thereof wherein the process is carried out in the presence of carbon dioxide to improve the selectivity of the catalyst for hydroxyl ammonium salt production.

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3,655,337
PROCESS FOR DESULFATION OF ALKALINE SOLUTIONS
Samuel M. Polinsky, Salt Lake City, Utah, and Alfred K. Schellinger, White Plains, N.Y., assignors to Kennecott Copper Corporation, New York, N.Y.
Filed May 16, 1969, Ser. No. 825,388
Int. Cl. C01f *11/46*, *7/02*
U.S. Cl. 23—122 6 Claims

A process for removing sulfates from alkaline solutions using barium hydroxide which is solubilized by heating a mixture of barium hydroxide and water. The barium hydroxide solution is then added to the alkaline solution containing sulfate ions, from which barium sulfate precipitates. Substantially all of the sulfate ions are precipitated with virtually no entrapment of other valuable ions. The barium sulfate can be regenerated to barium hydroxide by known means and recycled.

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3,655,338
CENTRIFUGAL FILTRATION OF MAGNESIUM SULFITE SLURRIES
Indravadan S. Shah, Forest Hills, N.Y., assignor to Chemical Construction Corporation, New York, N.Y.
Filed June 10, 1970, Ser. No. 45,254
Int. Cl. C01d *5/16*
U.S. Cl. 23—129 6 Claims

Magnesium sulfite slurry, derived from the scrubbing of a waste gas stream for sulfur dioxide removal with a circulating aqueous magnesium oxide-sulfite slurry, is processed to recover a solids cake rich in magnesium sulfite which may be subsequently calcined. The aqueous magnesium sulfite slurry is passed through a thickener so as to decant clear liquor, and the thickened slurry is heated to convert magnesium sulfite hexahydrate to the trihydrate form. The slurry is then passed through centrifugal separation means under controlled conditions of feed rate, initial total solids content and speed in revolutions per minute (rpm) of the centrifuge, so as to produce a residual wet solids cake with a moisture content of less than 5 percent by weight and an aqueous solution phase containing less than 1 percent residual solids by weight.

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3,655,339
PRODUCTION OF LOW-SODA ALUMINA
George MacZura, East St. Louis, Ill., and Alan Pearson, St. Louis, Mo., assignors to Aluminum Company of America, Pittsburgh, Pa.
Filed July 18, 1969, Ser. No. 843,181
Int. Cl. C01f *7/02*
U.S. Cl. 23—142 5 Claims

Production of a low-soda alumina by calcining an alumina starting material of low-soda content at 1,100°–1,400° C followed by leaching. The starting alumina material contains less than 0.25 percent by weight soda, and the final alumina contains less than 0.1 percent by weight soda. The calcining is continued until the product is at least 75 percent by weight alpha alumina. Reduction in amount of soda from the alumina starting material to the final alumina product is at least 75 percent.

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3,655,340
METHOD OF MANUFACTURING DIAMOND CRYSTALS
Tatsuo Kuratomi, 2-18 4-Chome, Hamatake Chigasaki-shi, Kanagawa-ken, Japan
Filed Aug. 7, 1969, Ser. No. 848,344
Claims priority, application Japan, Nov. 27, 1968, 43/086378
Int. Cl. C01b *31/06*
U.S. Cl. 23—209.1 5 Claims

Diamond crystals are produced by subjecting to elevated temperatures and pressures a mixture of a nondiamond form of carbon together with a mixture or alloy of nickel and phosphorus, which serves as the solvent and catalyst for the conversion to diamond form. Use of nickel and phosphorus for solvent and catalyst allows conversion of nondiamond carbon to diamond at lower pressures than previously utilized, i.e., from about 38,500 to about 49,000 atmospheres.

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3,655,341
CARBON BLACK PRODUCTION
Paul H. Johnson, Bartlesville, Okla., assignor to Phillips Petroleum Company
Filed Sept. 4, 1969, Ser. No. 855,113
Int. Cl. C09c *1/48*
U.S. Cl. 23—209.4 4 Claims

A method of increasing the photelometer of thermal black by passing the black through a furnace black reactor and in contact with hot gases produced therein. The mixture of thermal black and hot gases can be passed in indirect heat exchange with hydrocarbon feed to form the thermal black which is then passed into the furnace.

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3,655,342
DRYING CHLORINE
Otis C. Taylor, Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.
Filed Feb. 20, 1970, Ser. No. 13,184
Int. Cl. C01b *7/02*, *7/08*
U.S. Cl. 23—219 6 Claims

Water is removed from chlorine gas or liquid by incorporating phosgene into the chlorine and contacting the mixture with a drying catalyst which promotes hydrolysis of the phosgene. Water contents are thus reduced to a few parts per million, e.g. less than 10 parts per million, on a volume basis.

In a preferred embodiment, chlorine gas containing some carbon monoxide is passed through a phosgene generating catalyst such as activated carbon. The reaction conditions in the carbon bed are controlled to produce a sufficient amount of phosgene to react with much, if not all, of the water present in the chlorine gas on later contact with the drying catalyst.

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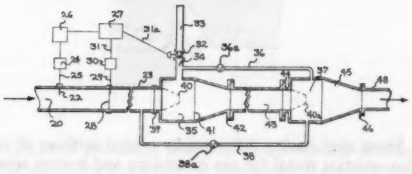
**3,655,343**

## APPARATUS FOR OXIDIZING A SPENT PULPING LIQUOR

**Sergio F. Galeano, Toledo, Ohio, assignor to Owens-Illinois, Inc.**

**Filed Apr. 13, 1970, Ser. No. 27,496**
**Int. Cl. B01j *1/00*; D21c *11/14***
**U.S. Cl. 23—284** **2 Claims**



A dual stage oxidation apparatus having a first and a second oxidation chamber arranged so that the first chamber convergingly extends in a pipelike manner and discharges into the second chamber, an inlet conduit for supplying spent pulping liquor into the first chamber, an atomizing nozzle attached to the end of the inlet conduit for spraying the spent liquor into the first chamber, the first chamber converging from a large radius to a lesser radius and forming a conduit, a second atomizing nozzle attached to the converging conduit end formed from the first chamber and terminating in the second chamber for spraying the now partially oxidized spent liquor leaving the first chamber into the second camber, for essentially complete oxidation, an outlet formed by the converging of the second reaction chamber from a large radius to a lesser radius forming thereby the exit conduit, an externally mounted oxygen line supplying oxygen to both the first chamber and the second chamber, an externally mounted circulating conduit connecting the inlet spent liquor conduit with the second reaction chamber, detection means for measuring the liquid volume flow and detection means for measuring the sulfide concentration of the spent liquor with both means mounted on the inlet conduit and measuring the flow and sulfide concentration before the spent liquor enters into the first chamber, and said detection means governing the amount of oxygen supplied to both the first chamber and to th e second for oxidizing the spent pulping liquor.

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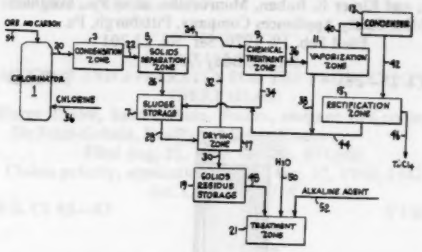
**3,655,344**

## TREATMENT OF TITANIUM TETRACHLORIDE DRIER RESIDUE

**Robert F. Mitchell, and Gordon A. Carlson, both of New Martinsville, W. Va., assignors to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed Sept. 2, 1969, Ser. No. 854,597**
**Int. Cl. B01d *9/02*, *11/02*; C01g *31/00***
**U.S. Cl. 23—299** **7 Claims**

The production of titanium tetrachloride by chlorination of titaniferous ores is described. Drier residue obtained from treatment of impure titanium tetrachloride is further treated




with water and alkaline reagent to insolubilize vanadium and chromium values present in said residue.

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**3,655,345**

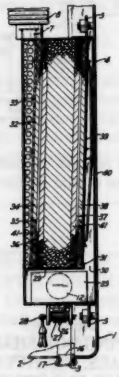
## METHOD OF GROWING ROD-SHAPED DISLOCATION-FREE MONOCRYSTALS, PARTICULARLY OF SILICON, BY CRUCIBLE-FREE FLOATING ZONE MELTING

**Hans-Eberhard Longo, Munich; Wolfgang Keller, Pretzfeld, and Carl-Heinz Vogel, Belecke-Mohne, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany**

**Filed Apr. 8, 1968, Ser. No. 711,641**
**Claims priority, application Germany, Mar. 9, 1967, S 108715**
**Int. Cl. B01j *17/10***
**U.S. Cl. 23—301 SP** **3 Claims**

Method of growing rod-shaped monocrystals by floating zone melting includes adjusting the orientation of the seed crystal in its holder so that a main crystal axis thereof, which extends substantially in the longitudinal direction thereof, is inclined at an angle between 0.5° and 5° to the direction in which the rotary axis of the seed holder extends, and, at the start of the relative movement between the induction heating coil and the rod for passing a molten zone axially through the rod, the rod holder and the crystal holder are moved relatively away from one another so as to increase the spacing therebetween and form a bottleneck-shaped constriction at the end of the rod to which the seed crystal is fused.

3,655,346
EMERGENCY BREATHING APPARATUS
Harry N. Cotabish, Allison Park; Layton A. Wise, Washington, and Elmer E. Buban, Monroeville, all of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.
Filed Feb. 19, 1970, Ser. No. 12,201
Int. Cl. B01j 7/00
U.S. Cl. 23—281 5 Claims



In emergency breathing apparatus a case has a back section and a removable front cover section that are normally held together. Inside the case an air regenerating canister is secured to the back section and has a port in one end, to which a flexible breathing hose is connected. The opposite end of the canister is provided with an opening in each side, each of which is connected with an opening in one end of a breathing bag extending along that side of the canister. The hose and bags normally are folded within the case. The other ends of the bags are connected by means formed to extend around the back of the neck of a user of the apparatus to suspend the bags over his chest when they are removed from the case, with the canister between the bags.

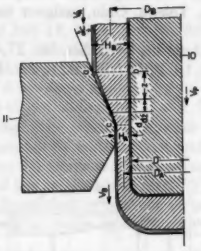
3,655,347
PROCESS OF EXTRACTING COPPER WITH CERTAIN SUBSTITUTED 2-HYDROXYBENZOPHENOXIMES
Philip L. Mattison, New Brighton, and Ronald R. Swanson, New Hope, both of Minn., assignors to General Mills, Inc.
Original application Mar. 18, 1968, Ser. No. 714,040. Divided and this application Aug. 12, 1970, Ser. No. 63,279
Int. Cl. B01d 11/04; C01g 3/00
U.S. Cl. 23—312 14 Claims

Certain 2-hydroxy benzophenoximes containing an electron withdrawing substituent(s). Compositions comprised of such benzophenoximes and certain α-hydroxy aliphatic oximes. Compounds and compositions are useful for the extraction of metal values.

3,655,348
PALLADIUM PHOSPHIDE CHALCOGENIDES
Tom Allen Bither, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Sept. 12, 1969, Ser. No. 857,560
Int. Cl. C01b 17/00, 19/00, 25/14
U.S. Cl. 23—315 5 Claims

At high pressures and temperatures in the vicinity of 1,000° C., palladium, phosphorus and a chalcogen, X, which can be S or Se combine to form compounds having the formula $PdP_yX_{2-y}$ in which $y$ is 0.67 when X is S and $y$ is 0.4 to 0.8 when X is Se and which have a pyrite-type crystal structure. The compounds $PdP_yX_{2-y}$ are electrical conductors with an essentially zero temperature coefficient of resistance from liquid helium temperature to room temperature. The compounds are useful as electrical resistors.

3,655,349
COATED SEAMLESS CONTAINERS AND METHOD OF FORMING
Dipak C. Shah; George W. Ward, and Roger L. Whiteley, all of Bethlehem, Pa., assignors to Bethlehem Steel Corporation
Filed Sept. 5, 1969, Ser. No. 855,475
Int. Cl. B23p 3/20
U.S. Cl. 29—196.4 10 Claims



Sheet steel having differentially coated surfaces of corrosion-resistant metal for use in drawing and ironing seamless articles and the method of forming said articles including coating the opposite surfaces of the sheet steel with metallic coatings having differing lubricity, drawing the coated sheet into a preform and ironing the preform.

3,655,350
COAL PELLET AND A METHOD OF MANUFACTURING SAME
Ronald W. Utley, Bethlehem, Pa., assignor to Bethlehem Steel Corporation
Continuation-in-part of application Ser. No. 732,449, May 27, 1968, now abandoned. This application Jan. 2, 1970, Ser. No. 399
Int. Cl. C10l 5/00, 5/16
U.S. Cl. 44—10 R 12 Claims

A coal pellet which is resistant to hydration and has good compressive strength and resistance to impact, containing fine particles of coal, and a coal tar pitch binder having a softening point of about 90° F. to about 190° F. and having a moisture content not greater than 10 percent. The coal pellet is produced by spraying coal tar pitch heated to a temperature of about 300° F. to about 600° F. onto fine particles of coal having a moisture content of about 12 percent to about 30 percent in a mixing vessel, pelletizing the resultant mixture and drying the pellets to the desired moisture content.

3,655,351
GASOLINE COMPOSITION
Ernest J. Jamieson, Highland Park, N.J., assignor to Cities Service Oil Company, Tulsa, Okla.
Filed May 29, 1969, Ser. No. 829,143
Int. Cl. C10l 1/18, 1/22
U.S. Cl. 44—66 13 Claims

Improved hydrocarbon fuel compositions suitable for employment in internal combustion engines, e.g., spark-ignition engines, compression-ignition engines, and turbine engines, and the operation of said internal combustion engines therewith. The hydrocarbon fuel compositions of the instant invention comprise a major proportion of a hydrocarbon fuel, especially one boiling in the gasoline boiling range, and a minor proportion of an additive which imparts to the hydrocarbon fuel composition detergent, anti-icing, and anti-

corrosion properties. The additives are hydrocarbon fuel-soluble organic compounds containing at least two amide linkages.

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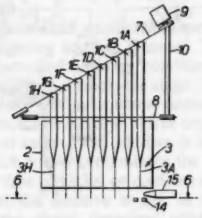
3,655,352

## METHOD OF MAKING CONTINUOUS FIBER BUNDLE

Ian R. Elliot, Leeds, England, assignor to The Rank Organisation Limited, London, England

Filed Apr. 7, 1970, Ser. No. 26,237
Claims priority, application Great Britain, Apr. 25, 1969, 21,319/69
Int. Cl. C03c *23/20, 29/00*
U.S. Cl. 65—4 6 Claims



A method of producing long continuous bundles of fibers consists in drawing out and bringing together fibers from rods of softenable material of different lengths. The rods are moved transversely during the drawing operation in the direction from the longest to the shortest rod. As each rod becomes too short for further use it is removed, its place being taken by the next shorter rod, and as each rod previously the longest rod is moved transversely its place is taken by a fresh rod of maximum length. Apparatus for manufacturing long continuous bundles of fiber includes a furnace and means for moving the rods axially into the furnace. It also includes means for moving the rods transversely at the same time and means for inserting fresh rods of maximum length and removing rods of minimum length.

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3,655,353

## GLASS FIBER SIZE

Charles E. Nalley, Shelby, and Joseph B. Lovelace, Forest City, both of N.C., assignors to PPG Industries Inc., Pittsburgh, Pa.

Filed May 21, 1969, Ser. No. 826,715
Int. Cl. C03c *25/02;* B44d *1/16*
U.S. Cl. 65—3 9 Claims

An aqueous forming size for treating a glass fiber strand, said size consisting essentially of a polypropylene emulsion, a textile lubricant and a coupling agent. The polypropylene emulsion can contain some emulsified polyethylene. The sized strands can be further coated with an aqueous rubber adhesive composition in preparation for use as reinforcement for rubber.

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3,655,354

## GRAPHITE CRUCIBLES FOR USE IN PRODUCING HIGH QUALITY QUARTZ

Herbert C. Quandt, Lakewood, Ohio, assignor to Union Carbide Corporation

Filed May 23, 1968, Ser. No. 731,616
Int. Cl. C03b *39/00*
U.S. Cl. 65—24 4 Claims

An improved graphite crucible suitable for fusing quartz particles to produce quartz boules of high quality produced by treating a crucible manufactured from highly oriented graphite stock of high purity and high permeability with a solution of a metal salt such as aluminum chloride. Quartz boules produced in such crucibles have been found to have a significantly lower bubble content and to be less adherent thereto than quartz boules produced in untreated crucibles made from similar graphite stock.

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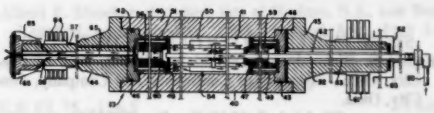
3,655,355

## METHOD AND APPARATUS FOR THE PRODUCTION OF SHEET GLASS

Pierre Tissier, Saint-Gobain, France, assignor to Compagnie De Saint-Gobain, Neuilly-sur-Seine, France

Filed Aug. 21, 1969, Ser. No. 851,905
Claims priority, application France, Aug. 27, 1968, 164244
Int. Cl. C03b *13/18*
U.S. Cl. 65—83 9 Claims



Process and apparatus for improving the smoothness and planarity of a sheet or ribbon of glass having a surface temperature of about 780° to 920° C. and having a viscosity of the order of $10^{6.5}$ to $10^{5}$ poises just before passing to and between a pair of metallic spaced smoothing and reducing rollers maintained uniformly at a surface temperature selected from a range of about 400° to 650° C. and by which the ribbon is reduced to 75 percent to 95 percent of its thickness prior to entry between the rollers. The surface temperature of the rollers is selected inversely as the temperature of the glass, within the ranges stated, and as shown upon the graph of Figure 1.

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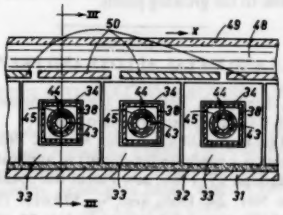
3,655,356

## REFRACTORY BLOCK FURNACE WALL

Gustave Javaux, Brussels, Belgium, assignor to Glaverbel, Watermael-Boitsfort, Belgium

Filed Oct. 3, 1969, Ser. No. 863,617
Claims priority, application Luxembourg, Oct. 4, 1968, 57030
Int. Cl. C03b *18/02*
U.S. Cl. 65—182 R 9 Claims



A wall of a refractory furnace comprises a plurality of refractory blocks positioned in side-by-side and/or end-to-end relationship. Each of the blocks is provided with a through passage and a structural member traverses the passage for anchoring the blocks to a supporting structure. The structural member may pass through a number of blocks placed in end-to-end relationship and the fluid medium may be conveyed through the passages for thermally conditioning the wall of the furnace.

3,655,357

## BORON PHOSPHATE AS BORON SOURCE FOR PLANT LIFE

Louis F. Ray, West Carrollton, Ohio, assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of application Ser. No. 673,279, Oct. 6, 1967, now abandoned. This application July 22, 1969, Ser. No. 843,846

Int. Cl. C05b *17/00*

U.S. Cl. 71—1 5 Claims

Boron phosphate provides a boron source which slowly releases nutrient amounts of soluble boron in soil for plant assimilation.

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3,655,358

## STABILIZED LIQUID FERTILIZER COMPOSITION

Robert S. Rickard, and Donald L. Whitfill, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed July 3, 1969, Ser. No. 839,083

Int. Cl. C05b *7/00*

U.S. Cl. 71—34 4 Claims

A high-analysis suspension fertilizer is prepared by ammoniating phosphoric acid containing polyphosphoric acid to produce a supersaturated solution of ammonium phosphate containing ammonium polyphosphate, and comminuted chrysotile asbestos as a suspension aid. Additional plant nutrient salts may be blended into said saturated solution in forming the suspension product.

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3,655,359

## PLANT GROWTH CONTROL

Eriks V. Krumkalns, and Harold M. Taylor, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of application Ser. No. 785,737, Dec. 20, 1968, now abandoned. This application Oct. 16, 1969, Ser. No. 867,058

Int. Cl. A01n *9/22*

U.S. Cl. 71—94 9 Claims

The growth of unwanted weed seeds and seedling weeds is inhibited by applying to the locus thereof a herbicidal composition containing one or more substituted 3-pyridylmethanes as the herbicidally active ingredient. The growth of suckers on tobacco plants is controlled by applying these compositions to the growing plants.

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3,655,360

## METALS AND METAL ALLOYS AND PREPARATION THEREOF

Robert H. Lindquist, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of application Ser. No. 796,222, Feb. 3, 1969, which is a continuation-in-part of application Ser. No. 582,238, Sept. 27, 1966, now Patent No. 3,458,306. This application Nov. 24, 1969, Ser. No. 879,610. The portion of the term of this patent subsequent to July 29, 1986, has been disclaimed.

Int. Cl. B22f *9/00*

U.S. Cl. 75—0.5 AC 3 Claims

Process for preparing dispersion-hardened metals and metal alloys, comprising forming a solution comprising metal halide precursors, selected from fluorides, bromides and iodides, of the continuous and dispersed phases of the final product, adding an epoxy compound to said solutions whereby a gel comprising metal hydroxides is formed, converting said metal hydroxides to oxides, and reducing the oxide precursors of the continuous phase of the final product, and products so prepared.

3,655,361

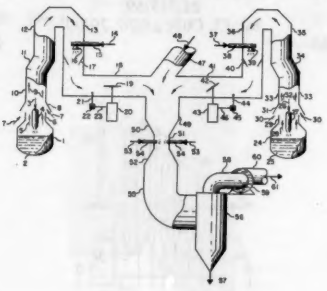
## CONTROLLED REMOVAL OF OFF-GAS FROM OXYGEN STEEL CONVERTERS

Bernard C. Brown, East Rockaway, N.Y., and Frank C. Braemer, Teaneck, N.J., assignors to Chemical Construction Corporation, New York, N.Y.

Filed Nov. 20, 1969, Ser. No. 878,435

Int. Cl. C21c *5/38*

U.S. Cl. 75—60 3 Claims



A plurality of oxygen steel converters discharge off-gas streams via individual air-ventilated hoods to a common disposal system. The dampers which control individual hood off-gas flows are modulated to provide an adequate removal rate from a converter hood at the peak of the blow period.

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3,655,362

## PROCESS FOR THE THERMAL REDUCTION OF ALUMINA-BEARING ORES

Walther Schmidt, Richmond, and Hubert Martin, Chesterfield County, both of Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed May 16, 1969, Ser. No. 825,399

Int. Cl. C22b *21/02*

U.S. Cl. 75—68 A 9 Claims

Aluminum-silicon alloys having an aluminum content greater than 50 weight percent aluminum are prepared by the thermal reduction of a furnace feed comprising alumina- and silica-bearing ores and elemental silicon to form aluminum alloys. The furnace feed is characterized by containing specified amounts of water of hydration in relation to the total amount of silica and alumina present, a specified amount of elemental silicon in relation to the total amount of silica and alumina and the feed has a silica to alumina ratio falling within specified limits. The thermal reduction is carried out by applying a rate of throughput of materials fast enough to effect dehydration while at the same time minimizing subsequent densification and induration in such a way that the furnace feed does not become fully calcined prior to introduction into the reaction zone of the furnace.

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3,655,363

## METHOD OF RECOVERING PALLADIUM

Mitsutoshi Tsutsumi, Kurashiki, Japan, assignor to Kuraray Co., Ltd., Kurashiki, Japan

Filed Oct. 23, 1970, Ser. No. 83,617

Int. Cl. C22b *11/04*, *11/08*

U.S. Cl. 75—101 R 6 Claims

Palladium is recovered from the palladium-containing precipitate formed in a palladium catalyzed alkyleneglycol ester synthesis by a process which comprises dissolving said precipitate in an aqueous solution of at least one of alkaline compound selected from the group consisting of alkali metal

hydroxides, alkali metal cyanides and ammonia reducing the palladium compound dissolved in the aqueous solution to form metallic palladium and separating said metallic palladium from the aqueous solution.

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3,655,364

## PROCESS FOR TREATING LOW-IRON NICKELIFEROUS ORES

David J. I. Evans, Site No. 9, R.R. No. 6, North Edmonton, Alberta, Canada, and Nicolas Zubryckyj, Praca Roamos de Azewedo 254, Sao Paulo, Brazil

Filed Feb. 27, 1970, Ser. No. 15,242
Int. Cl. C22b *23/04*
U.S. Cl. 75—103 4 Claims

Low iron nickeliferous weathered serpentine is mixed with an iron oxide bearing additive material. The mixture is calcined under controlled reducing conditions to convert contained nickel values to a leachable stage. The calcine material is then leached with an aqueous ammoniacal ammonium carbonate solution in contact with free oxygen containing gas to extract nickel values. The additive is substantially free of substances which would contaminate the leach solution and is substantially free of nickel or contains nickel in such form or amount that the additive is not, in itself, amenable to treatment by the above described calcining and leaching process. The additive is added in an amount sufficient to provide an iron content in the mixture of up to about 60% by weight.

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3,655,365

## HIGH SPEED TOOL ALLOYS AND PROCESS

Frederick C. Holtz, Jr., Evanston, Ill., assignor to IIT Research Institute, Chicago, Ill.

Continuation-in-part of application Ser. No. 518,181, Jan. 3, 1966, now abandoned, which is a continuation-in-part of application Ser. No. 435,733, Feb. 26, 1965. This application May 1, 1970, Ser. No. 33,990
Int. Cl. C22c *39/08, 39/50;* C21d *7/14*
U.S. Cl. 75—123 J 13 Claims

Compositions suitable for tool use and containing from about 10 to about 40% of a material selected from the group consisting of tungsten and molybdenum and mixtures thereof; from about 0.5 to about 4% carbon; at least one reactive metal selected from the group consisting of chromium, vanadium, niobium, tantalum, silicon and manganese; the balance a mixture of iron and cobalt. The alloy is formed by the hot consolidation of pre-alloyed powders and results in an alloy having a uniformly dispersed carbide phase of a grain size less than 3 microns.



3,655,366

## LOW ALLOY STRUCTURAL STEEL

Robert Allen De Paul, Sloatsburg, N.Y., assignor to The International Nickel Company, Inc., New York, N.Y.

Filed Oct. 13, 1969, Ser. No. 865,995
Int. Cl. C22c *39/20, 39/14*
U.S. Cl. 75—123 J 6 Claims

Low cost, precipitation hardenable, structural steels containing carbon, nickel, molybdenum and columbium, the steels being capable of developing high strength and both ambient and low temperature toughness. Other constituents can be present, notably copper, manganese, silicon, etc.

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3,655,367

## COPPER ALLOY

Albert B. Bleecker, deceased, late of Hudson, N.J., and Bessie Kornfeld, administratrix, 2345 Linwood Ave., Fort Lee, N.J.

Filed July 15, 1970, Ser. No. 55,294
Int. Cl. C22c *9/02, 9/04*
U.S. Cl. 75—156.5 2 Claims

An alloy, basically of copper and tin, with the addition of smaller properties of lead, magnesium and zinc provides a high strength, corrosion resistant material having a pleasing color which makes it particularly useful for ornamental structural purposes and jewelry. A particular example has the following composition: copper, 80–85 percent; tin, 10–15 percent; lead 0.20–0.30 percent; magnesium, 1.00–1.25 percent; and zinc, 0.15–0.25 percent. Smaller amounts of chromium, iron and silicon may also be added.

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3,655,368

## VACUUM SWITCH CONTACTS

John L. Walter, Scotia; Harvey E. Cline, Schenectady, and James D. Cobine, Rexford, all of N.Y., assignors to General Electric Company

Filed Jan. 7, 1970, Ser. No. 1,313
Int. Cl. C22c *19/00*
U.S. Cl. 75—170 2 Claims

Improved vacuum switch contact members have been fabricated from an electrically conductive hard metallic matrix containing a dispersoid of an electrically conductive metallic material which is insoluble in the matrix and which has a relatively high vapor pressure when heated by an arc developed between two such contact members. A specific example of a 96 weight per cent nickel, two per cent beryllium and 2 per cent bismuth composition is disclosed.

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3,655,369

## PERSISTENT INTERNAL POLARIZATION PROCESS IN ELECTROPHOTOGRAPHY

Koichi Kinoshita, Narashino-shi, Japan, assignor to Katsuragawa Denki Kabushiki Kaisha, Tokyo-to, Japan

Filed Sept. 3, 1968, Ser. No. 756,956
Claims priority, application Japan, Sept. 5, 1967, 42/56947
Int. Cl. G03g *13/00*
U.S. Cl. 96—1 7 Claims

In a method of forming an electrostatic latent image wherein a first electric field of one polarity is applied across a perfectly insulated type photosensitive element or an element including a transparent highly insulative layer integrally bonded to a photoconductive layer and then a second field of the opposite polarity is applied concurrently with the projection of a light image onto one side, uniform light is irradiated upon the opposite side of the photosensitive element concurrently with or before or after application of the first field but before application of the second field to improve the image forming property.

3,655,370

## PHOTOELECTROPHORETIC IMAGE TRANSFER

Leonard M. Carreira, Penfield, and Vsevolod Tulagin, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Original application Apr. 12, 1966, Ser. No. 542,050, now Patent No. 3,565,614, which is a continuation-in-part of application Ser. No. 384,737, July 23, 1964, now Patent No. 3,384,565. Divided and this application Aug. 24, 1970, Ser. No. 66,381. The portion of the term of this patent subsequent to May 21, 1985, has been disclaimed.

Int. Cl. G03g *13/22, 17/00*

U.S. Cl. 96—1.3 15 Claims

A photoelectrophoretic imaging system is described in which the formed image is electrostatically transferred. The transfer is aided by using uniform or imagewise light radiation of the image during transfer.

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3,655,371

## METHOD AND APPARATUS FOR REPRODUCING OPTICAL INFORMATION

George J. Chafaris, East Syracuse, N.Y., assignor to General Electric Company

Filed June 22, 1959, Ser. No. 822,097

Int. Cl. B41m *5/20*

U.S. Cl. 96—1.1 14 Claims

The disclosure relates to a method and apparatus for storing and reproducing information using a deformable material containing a volumetrically homogeneous distribution of particles for scattering light transmitted through said material. The information can be introduced and read-out in optical form.

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3,655,372

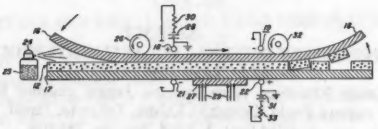
## IMAGE REVERSAL IN MANIFOLD IMAGING

Ivar T. Krohn; Geoffrey A. Page, and Gedeminas J. Reinis, all of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of application Ser. No. 609,058, Jan. 13, 1967, now abandoned. This application Oct. 16, 1970, Ser. No. 81,357

Int. Cl. G03g *13/22*

U.S. Cl. 96—1.3 23 Claims



An imaging system wherein there is provided a manifold set comprising a cohesively weak imaging layer sandwiched between a donor sheet and a receiver sheet. An electrical potential is placed across the set and the imaging layer is exposed to extended imagewise activating electromagnetic radiation. The electrical potential across the set is then modified causing the image which conventionally adheres to the receiver sheet upon separation to adhere to thedonor sheet and the image which conventionally adheres to the donor sheet to adhere to the receiver sheet.

3,655,373

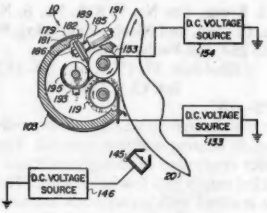
## CLEANING METHOD FOR ELECTROSTATIC COPYING MACHINES

Donald J. Fisher, and Gerard T. Severynse, both of Fairport, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Original application Aug. 26, 1968, Ser. No. 755,267, now Patent No. 3,572,923. Divided and this application May 11, 1970, Ser. No. 36,019

Int. Cl. G03g *13/22*

U.S. Cl. 96—1.4 3 Claims




Method and apparatus for removing residual images from a recording surface for reuse in a copying system. This is effected by wiping the electrostatic recording surface with an electrically non-conductive element to mechanically remove the toner particles from the surface. At the same time, an electrical bias of a polarity opposite that of the toner particles of sufficient magnitude is applied to the element so as to pull toner from the surface onto the element thereby removing substantially all of the toner from the surface. The element is advanced past an electrically biased means to remove the toner from the element thereby freeing it of the residual toner so that continuous cleaning action is obtained. After this, the toner is removed from the electrically biased means and collected for reuse in the system.

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3,655,374

## IMAGING PROCESS EMPLOYING NOVEL SOLID DEVELOPER MATERIAL

Frank M. Palermiti, Pittsford, and Arun K. Chatterji, Webster, both of N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Original application June 5, 1967, Ser. No. 643,377, now Patent No. 3,590,000. Divided and this application Aug. 27, 1970, Ser. No. 67,562

Int. Cl. G03g *13/16, 9/02*

U.S. Cl. 96—1.4 4 Claims

An electrostatic latent image is developed by using a finely-divided, rapid melting toner comprising a colorant, a solid, stable hydrophobic metal salt of a fatty acid, and a polymeric esterification product of a dicarboxylic acid and a diol comprising a diphenol.

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3,655,375

## INTERMITTENT GRIT REMOVAL PROCESS

Robert William Madrid, Macedon, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Dec. 29, 1969, Ser. No. 888,671

Int. Cl. G03g *13/14*

U.S. Cl. 96—1.4 6 Claims

In an electrostatographic reproduction process involving cascade-type development, an improvement is provided allowing intermittent removal of grit generated in the developer. The improvement comprises intermittently bypassing the normal reproduction cycle and interposing a grit-removal cycle wherein a charge is imposed upon the electrostatographic imaging surface relatively opposite in polarity to the charge of the accumulated grit in the developer; the developer is then cascaded over the charged

imaging surface and the grit is preferentially attracted thereto and separated from the developer system.

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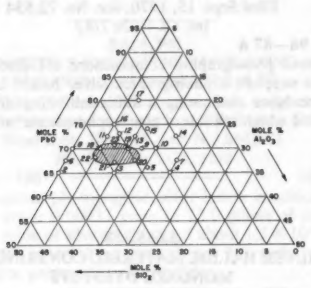
**3,655,376**
**ELECTROPHOTOGRAPHIC DENITRIFIED GLASS BINDER PLATE**
**Charles Wood, Sycamore, Ill.; John C. Schottmiller, Penfield, N.Y., and Rustum Roy, State College, Pa., assignors to Xerox Corporation, Stamford, Conn.**
**Continuation-in-part of application Ser. No. 539,097, Mar. 31, 1966, now abandoned. This application May 20, 1970, Ser. No. 39,691**
**Int. Cl. G03g** *5/04*
**U.S. Cl. 96—1.5** **6 Claims**



A xerographic plate comprising a two-phase layer one component of which is a photoconductive metal oxide which has been recrystallized in a glassy binder. The two-phase photoconductive plate is prepared by mixing a major proportion of the photoconductive metal oxide and minor proportions of other glass formers, fusing the mixture and cooling it so as to form a single glass phase, and then heat treating the single phase glass so as to precipitate the metal oxide as finely divided, uniformly dispersed particles.

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**3,655,377**
**TRI-LAYERED SELENIUM DOPED PHOTORECEPTOR**
**Ronald P. Sechak, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.**
**Continuation-in-part of application Ser. No. 583,686, Oct. 3, 1966, now abandoned. This application June 26, 1970, Ser. No. 50,265**
**Int. Cl. G03g** *5/00*
**U.S. Cl. 96—1.5** **23 Claims**

A photosensitive element having a three layered photoconductive portion comprising a first layer of vitreous selenium or a vitreous arsenic-selenium alloy, a second layer comprising a vitreous selenium-tellurium alloy, and a third layer comprising a vitreous alloy of arsenic-selenium. A method of imaging the photosensitive element is also described.

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**3,655,378**
**CHARGE-TRANSFER COMPLEXES OF DIBENZOFURAN-FORMALDEHYDE OR DIBENZOTHIOPHENE-FORMALDEHYDE RESINS AS PHOTOCONDUCTIVE MATERIALS**
**Lawrence E. Contois, Webster; Stewart H. Merrill, Rochester, both of, NY, and George S. Grau, Hightstown, N.J., assignors to Eastman Kodak Company, Rochester, N.Y.**
**Filed Mar. 1, 1971, Ser. No. 119,956**
**Int. Cl. G03g** *5/06*
**U.S. Cl. 96—1.5** **10 Claims**

Certain formaldehyde resins are disclosed which form complexes with Lewis acids such as trinitrofluorenone to produce photoconductive compositions and elements of high speed and utility for electrostatic image formation.

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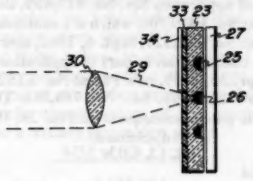
**3,655,379**
**PRINTING BY VAPOR PROPULSION**
**Robert W. Gundlach, Victor, N.Y., assignor to Xerox Corporation, Rochester, N.Y.**
**Filed Oct. 29, 1969, Ser. No. 872,135**
**Int. Cl. G03c** *5/00*
**U.S. Cl. 96—27** **8 Claims**




A liquid ink layer is formed on the surface of a transparent substrate. The ink layer is exposed through the substrate to high energy radiation causing exposed ink areas to move to a receiver sheet. It is believed that the ink is transferred by the rapid expansion of vapor.

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**3,655,380**
**DIFFUSION TRANSFER PRODUCT AND PROCESS CONTAINING 5-SELENO-1,2,3,4-TETRAZOLE**
**Timothy F. Parsons, Hilton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**
**Filed Jan. 14, 1970, Ser. No. 2,964**
**Int. Cl. G03c** *5/54*
**U.S. Cl. 96—29** **14 Claims**

Seleno tetrazoles such as 1-phenyl-5-seleno-1,2,3,4-tetrazole, 1-allyl-5-seleno-1,2,3,4-tetrazole, etc. are used as toners in a diffusion transfer process. The toner can be incorporated in the receiving sheet or in a processing solution. These toners are particularly useful when employed in a diffusion transfer process to improve the stability of the toned image.

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**3,655,381**
**PROCESS FOR THE PRODUCTION OF INTEGRALLY FORMED, RANDOM DOT PHOTOGRAPHIC IMAGES**
**Whitelaw C. Roemer, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**
**Filed Apr. 24, 1969, Ser. No. 819,088**
**Int. Cl. G03f** *7/02, 5/00*
**U.S. Cl. 96—33** **11 Claims**

Integrally screened, random dot images are prepared with no conventional screening by using grainy images as the exposure image for high-contrast, light sensitive elements. The resultant dot images can be used directly or advantageously, for example, as a lith type image for the preparation of lithographic plates.

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**3,655,382**
**PROCESSES FOR CONVERTING ZERO-VALENT METALS PHOTOGRAPHIC IMAGES TO FORMAZAN DYE IMAGES**
**Albert T. Brault, Rochester, and Vernon L. Bissonette, Brockport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**
**Filed Feb. 25, 1970, Ser. No. 14,229**
**Int. Cl. G03c** *5/24, 7/24*
**U.S. Cl. 96—48** **11 Claims**

A zero valent metal image in which the metal has a standard oxidation potential more positive than −0.98 volt is ad-

vantageously converted to a nondiffusible formazan dye image by the single process step of contacting the metal image with a solution of a tetrazolium salt that contains a metal complexing moiety when the combination of tetrazolium salt, metal and water produces a solution reaction potential E of at least +0.01 volt.

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**3,655,383**

**METHOD FOR REPRODUCING IMAGES OF A SOLID PHOTOCATALYST WITH AN OXIDIZING AGENT**

**Joseph W. Shepard, St. Paul, and Benjamin L. Shely, White Bear Lake, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Continuation of application Ser. No. 517,469, Dec. 29, 1965, now Patent No. 3,429,706, which is a continuation of application Ser. No. 221,329, Sept. 4, 1962, now abandoned, which is a continuation-in-part of application Ser. No. 809,927, Apr. 30, 1959, now Patent No. 3,152,903. This application Nov. 29, 1968, Ser. No. 780,283. The portion of the term of this patent subsequent to Feb. 25, 1986, has been disclaimed.**

**Int. Cl. G03c** *5/54*

**U.S. Cl. 96—64** **3 Claims**

The present invention relates to an embodiment of the invention disclosed in U.S. Pat. No. 3,152,903 in which a radiation image is reproduced by exposing a carrier bearing a photocatalyst and an oxidizing agent to radiation to reduce a portion of the oxidizing agent present to a free metal defining a latent image which serves as a catalyst site for the subsequent development reaction of a reducing agent and the non-reduced oxidizing agent.

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**3,655,384**

**ANTI-STATIC COATING FOR PHOTOGRAPHIC EMULSION LAYERS**

**Henry Walter Wood, Ilford, England, assignor to Ilford Limited, Ilford, Essex, England**

**Filed July 31, 1970, Ser. No. 60,100**

**Int. Cl. G03c** *1/76*

**U.S. Cl. 96—67** **6 Claims**

This application describes a method of improving the surface electrical conductivity of photographic material which is characterized in that it comprises coating on to the surface of the photographic material an aqueous solution of kappa-carrageenan and a sufficient amount of a salt of potassium or ammonium to cause the kappa-carrageenan to gel, allowing the coated lay er to gel and drying the photogra phic material.

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**3,655,385**

**TORTILLA AND PROCESS USING EDIBLE HYDROPHILIC GUM**

**Manuel Jesus Rubio, Bridgeport, Conn., assignor to Roberto Gonzalez Barrera, Monterrey, Mexico**

**Filed June 8, 1970, Ser. No. 44,585**

**Int. Cl. A21d** *2/18*

**U.S. Cl. 99—80 R** **12 Claims**

To retard the staling of tortillas, which are an unleavened unshortened food product made from nixtamalized corn or corn flour and to increase the yield of dough and tortillas by incorporating an additive in making the tortilla dough. The additive is edible hydrophilic gum.

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**3,655,386**

**ANTI-STATIC COATINGS FOR PHOTOGRAPHIC MATERIALS**

**Henry Walter Wood, Ilford, England, assignor to Ilford Limited, Ilford, Essex, England**

**Filed Feb. 9, 1970, Ser. No. 9,951**

**Claims priority, application Great Britain, Feb. 10, 1969, 7,151/69**

**Int. Cl. G03c** *1/82*

**U.S. Cl. 96—87 A** **5 Claims**

This application describes a method for improving the surface conductivity of photographic material which is characterized in that it comprises coating on to the surface of the photographic material an aqueous alcohol solution which comprises at least 0.2 percent by weight of sodium cellulose sulfate which has, on an average, at least two sulfate radicals per glucose unit in the cellulose chain, and then drying the photographic material.

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**3,655,387**

**ANTISTATIC PHOTOGRAPHIC COMPOSITIONS**

**Pierre Daniel Collet, and Guy Clero, both of Vincennes, France, assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Sept. 15, 1970, Ser. No. 72,534**

**Int. Cl. G03c** *1/82*

**U.S. Cl. 96—87 A** **9 Claims**

Improved photographic compositions are disclosed comprising a support, a photographic silver halide layer and at least one layer containing a static-inhibiting amount of a compound which is a salt of glycerophosphoric acid.

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**3,655,388**

**SILVER HALIDE MATERIAL CONTAINING A MONOAZO DYESTUFF**

**Bernh ard Piller, Marly-le-Petit, Switzerland, assignor to Ciba Limited, Basel, Switzerland**

**Filed Feb. 11, 1970, Ser. No. 10,602**

**Claims priority, application Switzerland, Feb. 13, 1969, 2163/69**

**Int. Cl. G03c** *1/10*

**U.S. Cl. 96—99** **11 Claims**

Photographic light-sensitive material especially for the silver dyestuff bleaching process containing a monoazo dyestuff of the formula G—N N—E(M—)$_{m-1}$(NH—Y—Q)$_{n-1}$NH—Z—A

in which G is a naphthalene radical which in 1-position contains an azo group, in 2-position a phenylamino group and in 8-position a hydroxyl group and at least one sulfonic acid or sulfonic acid amide group, E is an aromatic radical which contains at most 2 sulfonic acid or sulfonic acid amide groups, M is a phthalic acid imide or an —NH—X—D— radical, X and Y are —CO— or —CO—NH— radicals, D and Q are aromatic radicals, Z is an —$SO_2$—, —CO— or —CO—NH— radical, A is an aliphatic aromatic or heterocyclic radical and m and n are 1 or 2. These dyestuff are magenta dyestuffs and are fast to diffusion, easily soluble in water insensitive to calcium ions and completely bleachable to white.

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**3,655,389**

**COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL CONTAINING SILVER OCCLUSION PREVENTING AGENT**

**Yukio Yasuda; Nobuo Tsuji, and Takushi Miyazako, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Sept. 22, 1970, Ser. No. 74,521**

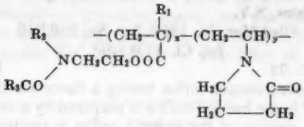
**Claims priority, application Japan, Sept. 22, 1969, 44/75465**

**Int. Cl. G03c** *1/40*

**U.S. Cl. 96—100** **12 Claims**

A color photographic silver halide light-sensitive material comprising a support having a silver halide light-sensitive emulsion layer thereon wherein a copolymer is incorporated in said light-sensitive emulsion layer or a non-light-sensitive

auxiliary layer on said support, said copolymer being represented by the following formula:



wherein $R_1$ represents hydrogen or methyl, $R_2$ represents hydrogen, methyl, ethyl, propyl or butyl, $R_3$ represents hydrogen, methyl, ethyl, propyl and $x/y$ varies from 95/5 to 20/80.

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**3,655,390**

**DIRECT POSITIVE EMULSIONS CONTAINING AMINE BORANES AND BISMUTH SALTS**

**Joseph De Witt Overman, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**Filed Sept. 26, 1969, Ser. No. 861,501**
**Int. Cl. G03c** *1/28, 1/36*
**U.S. Cl. 96—108** **10 Claims**

Direct positive photographic silver halide emulsion layers containing about 0.00033 gram to 12.0 grams of an amine borane per mole of silver halide, and about $1.5 \times 10^{-7}$ to $1.2 \times 10^{-5}$ moles of a salt of bismuth per 1.5 moles of silver nitrate used to prepare the silver halide.

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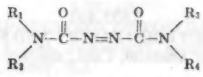
**3,655,391**

**AZODICARBONAMIDE FOG INHIBITORS**

**Paoli Merli, Condominio Isonzo-Via Colombo, Pordenone, and Luigi Valbusa, Via Gramsci, Ferrania, Savona, both of Italy**

**Continuation-in-part of application Ser. No. 856,485, Sept. 9, 1969. This application Oct. 23, 1969, Ser. No. 868,908**
Claims priority, application Italy, May 16, 1969, 37, 118 A/69; Aug. 1, 1969, 39, 154 A/69; Sept. 9, 1969, 39, 648 A/69
**Int. Cl. C07c** *107/02;* **G03c** *1/34*
**U.S. Cl. 96—109** **11 Claims**

Azodicarbonamides, preferably having the general formula



wherein $R_1$, $R_2$, $R_3$ and $R_4$ individually are hydrogen, alkyl, aryl, or heterocyclic groups, or wherein the pairs of groups $R_1 - R_2$ or $R_3 - R_4$ represent atoms necessary to complete a heterocyclic ring, are effective fog-inhibitors for silver halide photographic emulsions.

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**3,655,392**

**PHOTOGRAPHIC SILVER HALIDE EMULSION SENSITIZED WITH A METHINE DYE**

**Arthur Fumia, Jr., Hilton, and Leslie G. S. Brooker, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed June 4, 1969, Ser. No. 830,483**
**Int. Cl. G03c** *1/08*
**U.S. Cl. 96—131** **14 Claims**

Novel cyanine and merocyanine dyes are provided which feature a nucleus selected from the group consisting of a 1-(3,-4,4*a*,5,6,7-hexahydro-2-naphthyl)pyrrolidine group, a 1-(3,3*a*,4,5-tetrahydro-2H-inden-6-yl)pyrrolidine group, a 1-(2-norbornylidene)-pyrrolidine group, and a 1-(1-indanylidene)pyrrolidine group.

**3,655,393**

**PHOTOGRAPHIC EMULSION CONTAINING TERTIARY AMINO ALKYL SUBSTITUTED RHODANINE AND THIOBARBITURIC ACID MEROCYANINE DYE**

**Earl J. Van Lare, and Arthur Fumia, Jr., both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed June 16, 1969, Ser. No. 833,748**
**Int. Cl. G03c** *1/08*
**U.S. Cl. 96—140** **6 Claims**

Novel merocyanine dyes are provided which feature first and second nuclei joined by a double bond, a dimethine, a tetramethine or hexamethine linkage, the first nucleus being a rhodanine nucleus or 2-thiobarbituric acid nucleus joined at the five-carbon atom thereof to said linkage; and, the other nucleus being a five- to six-membered nitrogen-containing heterocyclic basic nucleus of the type used in merocyanine dyes joined at a carbon atom thereof to said linkage, said heterocyclic nitrogen atom of said nucleus having attached thereto a tertiary aminoalkyl group.

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**3,655,394**

**PREPARATION OF SILVER HALIDE GRAINS**

**Bernard D. Illingsworth, deceased, late of Rochester, N.Y. (by Mary D. Illingsworth, executrix), assignor to Eastman Kodak Company, Rochester, N.Y.**

**Continuation-in-part of application Ser. No. 500,366, Oct. 21, 1965, now abandoned. This application Aug. 25, 1969, Ser. No. 853,236**
**Int. Cl. G03c** *1/28, 1/02*
**U.S. Cl. 96—108** **14 Claims**

Photographic emulsions comprising cubic-regular grains free of reduction sensitization are prepared by running an aqueous solution of silver nitrate and an aqueous solution of a silver halide simultaneously into an agitated aqueous solution of a peptizer in a double-run precipitation procedure while maintaining the pH at no more than 4.0 and the pAg at a value within the range of 8.6 to 9.1. In one aspect of this invention, emulsions prepared by the above procedure are chemically sensitized with a compound containing a labile atom selected from the group consisting of sulfur, selenium and tellurium and spectrally sensitized with a cyanine dye having an anodic half-wave potential less than 1.0 volt and a cathodic half-wave potential less than −0.8 volt.

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**3,655,395**

**PROCESS FOR TREATING WASTE MATERIALS**

**John N. Karnemaat, 1304 West Maple St, Kalamazoo, Mich.**

**Filed Jan. 10, 1969, Ser. No. 790,475**
**Int. Cl. A23k** *1/22;* **C05c** *9/00;* **C02b** *1/18*
**U.S. Cl. 99—2 R** **6 Claims**

A process for treating odiferous industrial and municipal waste materials by adding formaldehyde, nitric acid and urea to the waste materials in sequence in order to obtain an economically desirable product.

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**3,655,396**

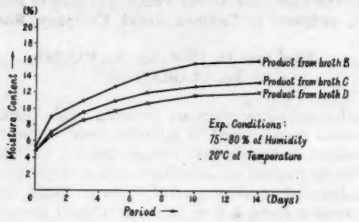
**PROCESS FOR PREPARING PULVERIZED FEED FOR ANIMALS**

**Yasuo Goto, Chita-gun, Aichi, and Akio Taki, Handa-shi, Aichi, both of Japan, assignors to Nihon Shokuhin Kako Co., Ltd., Tokyo, Japan**

**Filed May 6, 1969, Ser. No. 822,188**
**Claims priority, application Japan, May 14, 1968, 43/31916**
**Int. Cl. A23k** *1/00;* **C12b** *1/00*
**U.S. Cl. 99—9** **10 Claims**

A process for preparing pulverized feed for animals which comprises inoculating light steep liquor of corn with non-pathogenic microorganisms (yeasts, molds and bacteria) having the property of metabolizing lactic acid under aerobic

conditions to culture said microorganisms, and concentrating and drying the resulting cultured broth wherein the amount




of the lactic acid is reduced, to obtain the pulverized feed therefrom.

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3,655,397

**FLAVOR COMPOSITIONS AND PROCESSES**

**Thomas H. Parliment, Valley Cottage; William P. Clinton, Monsey; Richard Scarpellino, Ramsey; Robert J. Soukup, New York, and Martin F. Epstein, Pearl River, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.**

**Continuation-in-part of application Ser. No. 867,887, Oct. 20, 1969, now abandoned, which is a continuation-in-part of application Ser. No. 857,227, Sept. 11, 1969, now abandoned.**

**This application Mar. 30, 1971, Ser. No. 129,609**

**Int. Cl. A23f** *1/12*; **A23l** *1/26*

**U.S. Cl. 99—65** **15 Claims**

Enhancement of the flavor of foodstuffs, especially coffee-flavored foodstuffs, is achieved by the addition of 2-nonenal or 2ononenol. Particular derivatives of both the alcohol and the aldehyde are also useful.

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3,655,398

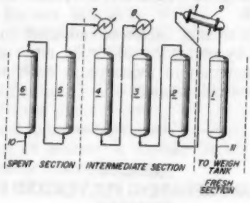
**PROCESS FOR MANUFACTURE OF COFFEE EXTRACT**

**Esra Pitchon, Flushing; Martin Gottesman, Suffern, and Robert W. Meier, Massapequa, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.**

**Filed May 25, 1970, Ser. No. 40,064**

**Int. Cl. A23f** *1/08*

**U.S. Cl. 99—71** **13 Claims**




A new coffee extraction process has been discovered whereby a high concentration coffee extract, about 30–41 percent solids by weight of extract, can be produced in an ordinary percolation set with little, if any, loss of extraction yield. The key steps in this process include the use of intercolumn heaters to raise the temperature of the extraction liquor as it passes from column to column and reversing the flow of the extraction liquor through the extraction columns, at least in the spent end of the percolator set.

3,655,399

**INSTANT COFFEE AND PROCESS FOR MAKING SAME**

**Esra Pitchon, Flushing, and Ernest L. Earle, Jr., New City, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.**

**Filed Mar. 26, 1969, Ser. No. 810,810**

**Int. Cl. A23f** *1/08*

**U.S. Cl. 99—71** **11 Claims**

An improved instant coffee having a flavor which is more like that of home brewed coffee is prepared by a unique new process. A portion of the roasted coffee is treated prior to percolation to remove desirable flavor notes. The partially extracted coffee is then combined with the remainder of the roasted coffee and subjected to a standard percolation operation. The liquor containing the flavor notes is added back into the system at the fresh stage in percolation or is combined with the final extract from the percolators.

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3,655,400

**PRODUCTION OF SHELF STABLE REHYDRATABLE RICE**

**Joseph Cseri, Tarrytown; Joseph John Halik, Ossining, and Milton Kaplow, White Plains, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.**

**Filed July 17, 1969, Ser. No. 842,691**

**Int. Cl. A23l** *1/10*

**U.S. Cl. 99—80 PS** **6 Claims**

Production of shelf stable dehydrated rehydratable rice having greater than usual moisture contents by cooking rice in a solution comprising polyhydric alcohols salts, and an antimycotic agent.

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3,655,401

**PASTA PROCESS AND PRODUCTS**

**Joseph John Halik, Ossining, N.Y., assignor to General Foods Corporation, White Plains, N.Y.**

**Filed July 28, 1969, Ser. No. 845,484**

**Int. Cl. A23l** *1/16*

**U.S. Cl. 99—85** **6 Claims**

Process of producing shelf stable dehydrated rehydratable pasta products having greater than usual moisture contents, by cooking said pasta products in a solution comprising polyhydric alcohols salts, and an antimycotic.

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3,655,402

**COMBINED FOOD PASTRY AND FILLING**

**Ernest V. Dougan, Anaheim, Calif., assignor to Hunt-Wesson Foods, Inc.**

**Filed Nov. 3, 1969, Ser. No. 873,474**

**Int. Cl. A21d** *13/00*

**U.S. Cl. 99—86** **14 Claims**

A frozen unbaked pastry dough in an annular configuration having a bottom surrounding a frozen filling encased in an open bottomed metal cylinder which, upon baking, forms a patty shell with raised sides for containing the filling after removal of the cylinder, is described, along with a process for preparing the frozen and baked products.

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3,655,403

**TREATMENT OF FLOUR AND DOUGH**

**Frederick D. Vidal, Englewood Cliffs, N.J., assignor to Pennwalt Corporation, Philadelphia, Pa.**

**Filed June 27, 1969, Ser. No. 837,344**

**Int. Cl. A21d** *2/26*

**U.S. Cl. 99—91** **20 Claims**

For the improvement of flour, dough and baked products, notably bread, a partial hydrolysate of edible protein, such as soya protein or wheat gluten, is prepared by acid hydrolyzing treatment which is controlled to limit the hydrolysis within a range short of completeness, and this hydrolysate product is incorporated with the flour, e.g., in dough mixtures. Such

treatment of the flour provides improved properties, as in the dough and notably as to volume and texture of the resulting loaves or other products. The partial hydrolysate, useful in a wide range of proportions, is effective alone or in coaction with chemical-type improving agents, and can be formulated with finely-divided diluent to yield a pulverulent composition readily suitable for addition to or with flour, in making up dough.

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**3,655,404**
**SHELF STABLE FRENCH TOAST**

**George Glasser, Ossining, N.Y.; Frank Hollis, Hillsdale, N.J., and Milton Kaplow, White Plains, N.Y., assignors to General Foods Corporation, White Plains, N.Y.**

**Filed Apr. 3, 1969, Ser. No. 813,300**
**Int. Cl. A21d** *13/08*
**U.S. Cl. 99—92** **6 Claims**

French toast having a moisture content between 14 and 32 percent and an $A_w$ between 0.80 and 0.90 is prepared by saturating bread with an emulsion containing 15 to 35 percent water soluble sugar solids, 3–15 percent edible polyhydric alcohol and an effective level of antimycotic to prevent mold growth. The product may be stored for long periods of time without the need of sterilization or refrigeration.

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**3,655,405**
**SOUFFLE MIX**

**Albert J. Karas, and John E. Vey, both of Baltimore, Md., assignors to McCormick & Company, Inc., Cockeysville, Md.**

**Filed Jan. 8, 1970, Ser. No. 1,562**
**Int. Cl. A21d** *2/02, 2/18*
**U.S. Cl. 99—94** **4 Claims**

A dry, essentially fat-free souffle composition is packaged in two containers. One package contains a dry sauce mix which is a blend of regular starch, pregelatinized starch, whey solids, a sweetening agent and a confectionery flavoring agent. The second package contains a dry albumen mix which is a blend of egg white solids, a leavening agent, a stabilizing agent and a sweetening agent. Water is separately added to the dry mixes and the resulting wet mixes are folded together and baked to produce a high quality souffle.

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**3,655,406**
**CAROTENOID COMPOSITIONS**

**Heinrich Klaui, Riehen, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.**

**Filed Feb. 2, 1970, Ser. No. 8,004**
**Claims priority, application Switzerland, Feb. 7, 1969, 1888/69**
**Int. Cl. A23l** *1/26*
**U.S. Cl. 99—148 C** **12 Claims**

Carotenoid compositions dispersed in a hydrophilic, organic colloid such as gelatin which is distributed on the particles of a pulverulent carrier material such as starch which has a lipophilic surface.

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**3,655,407**
**METHOD OF COATING DILUTE AQUEOUS EMULSIONS**

**Carl W. McGraw, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Mar. 10, 1969, Ser. No. 805,788**
**Int. Cl. G03c** *1/72, 1/78*
**U.S. Cl. 96—114** **5 Claims**

An aqueous composition of a hydrophilic colloid, wherein said colloid comprises from about .1 to about 6 per cent by weight of said solution, is given increased viscosity by the low-level addition of a copolymer comprising: (1) at least 50 mole per cent of units of an acrylic acid and (2) up to 50 mole per cent of units of an alkyl acrylate. The copolymer is added at a concentration in the range of about 0.01 to about 1 per cent by weight of the aqueous composition. Aqueous compositions of hydrophilic colloids such as, for example, silver halide photographic emulsions, are thickened as described and can be coated on a wide variety of supports in single- or multi-layer photographic elements.

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**3,655,408**
**AROMATIC SUBSTANCES OBTAINED FROM ANIMAL OR VEGETABLE TISSUES**

**Pierre L. J. Charier-Vadrot, 1, route de Lagnes, 84 Cavaillon, France**

**Filed May 9, 1969, Ser. No. 823,531**
**Claims priority, application France, May 10, 1968, 22272**
**Int. Cl. A23l** *1/28*
**U.S. Cl. 99—140 R** **20 Claims**

Animal or vegetable tissues having no perceptible flavoring properties are soaked in an aqueous solution until the solution becomes aromatic. The aqueous solution in which the animal tissues are soaked contains sugar, vitamin and an inorganic salt while that in which the vegetable tissues are soaked contains various inorganic salts. The temperature of the solution, the illumination and atmosphere surrounding the solution, and the length of time of the soaking step are controlled. The animal or vegetable tissue employed can be lyophilized.

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**3,655,409**
**COCONUT PRODUCTS AND PROCESSES**

**George Glasser, Ossining, and Joseph Cseri, North Tarrytown, both of N.Y., assignors to General Foods Corporation, White Plaines, N.Y.**

**Filed Aug. 19, 1969, Ser. No. 851,469**
**Int. Cl. A23l** *1/00*
**U.S. Cl. 99—125** **6 Claims**

Producing high moisture shelf stable comminuted coconut having greater than usual moisture contents, by subjecting the coconut to pressurized heating sufficient to increase the surface area releasing the pressure and, treating said coconut in a solution comprising polyhydric alcohols, salts and an antimycotic, and mixing said solution treated coconut with sugar blends.

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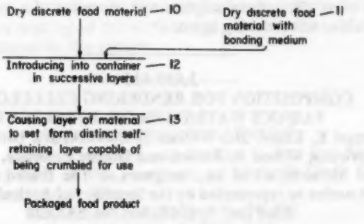
**3,655,410**
**METHOD OF PACKAGING TWO OR MORE DISCRETE FOODSTUFFS**

**John H. Forkner, 6037 North Van Ness Blvd., Fresno, Calif.**

**Filed Feb. 24, 1969, Ser. No. 801,297**
**Int. Cl. B65b** *3/00*
**U.S. Cl. 99—171 R** **11 Claims**


Dry discrete food material — 10
Dry discrete food material with bonding medium — 11
Introducing into container in successive layers — 12
Causing layer of material to set form distinct self-retaining layer capable of being crumbled for use — 13
Packaged food product

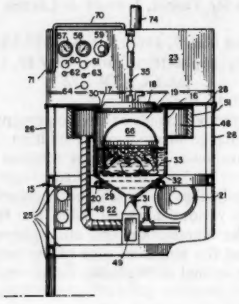
A method of making a consumer food package consisting of at least two layers of different dried food materials by introducing the materials into a container in discrete form and there after causing one of the materials to take a set form whereby it remains as a solid.

3,655,411

## APPARATUS FOR PRESSURIZED COOKING OF FOODS IN HIGH-TEMPERATURE NON-AQUEOUS LIQUIDS

Charles Jere Albright, 313 West N. Ave., Chicago, Ill.

Filed Aug. 5, 1968, Ser. No. 750,353
Int. Cl. A47j *27/08*
U.S. Cl. 99—330 29 Claims



The essential concept of this invention involves an improved structuring of an apparatus for the pressurized cooking of foods in high-temperature, non-aqueous liquids for a time-controlled period and effect a nearly instant separation of the cooked foods from the pressure and the hot liquid at the termination of each cooking period so as to retain in the cooked food the juices inherent in the food.

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3,655,412

## PROCESS FOR THE PRODUCTION OF DISPERSIONS OF COLLOIDAL SILVER

Akira Kumai, and Yasuhisa Ogawa, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara-Kamigun, Kanagawa, Japan

Filed Nov. 15, 1968, Ser. No. 776,272
Claims priority, application Japan, Nov. 15, 1967, 42/73502
Int. Cl. C23c *3/02*
U.S. Cl. 106—1 7 Claims

Dispersions of colloidal silver having a neutral black or slightly bluish-black color are disclosed.

The process for forming the above described dispersions in gelatin comprises mixing an aqueous alkaline gelatin solution with an aqueous solution of a water-soluble silver salt and from 0.005 to 0.7 moles of a water-soluble manganous salt per mole of said silver salt, and then reducing the silver salt by adding thereto at least 0.2 moles per mole of said silver salt of an alkali metal sulphite and an excess of a water-soluble silver salt reducing agent.

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3,655,413

## COMPOSITION FOR RENDERING CELLULOSIC FABRICS WATER-AND-OIL-REPELLENT

Samuel E. Ellzey, Jr.; William J. Connick, Jr., both of New Orleans; Wilson A. Reeves, and George L. Drake, Jr., both of Metairie, all of La., assignors to The United States of America as represented by the Secretary of Agriculture

Filed Dec. 9, 1969, Ser. No. 883,624
Int. Cl. C09k *3/18*
U.S. Cl. 102—2 1 Claim

The reaction product of tetrakis(hydroxymethyl) phosphonium salts and primary 1,1-dihydroperfluoroalkylamines, when applied from aqueous emulsions, renders cellulosic materials repellent to oil and water and increases their resistance to staining by oily materials.

3,655,414

## FOUNDRY MOLD PROCESS AND PATTERN COMPOSITION

William D. Hoffman, Park Forest, and Allen E. Larson, Chicago, both of Ill., assignors to Atlantic Richfield Company, New York, N.Y.

Filed June 10, 1969, Ser. No. 832,013
Int. Cl. C08h *9/06*
U.S. Cl. 106—38.8 18 Claims

Novel pattern materials for use in investment casting by the Lost Wax process are disclosed. The pattern materials consist essentially of waxes such as petroleum waxes, natural vegetable or mineral waxes, synthetic waxes and various resinous materials derived from the refining of petroleum and wood resin, and mixtures of the above. The base wax generally has a melting point of between about 120° to 180° F. The base wax composition is improved by the inclusion of up to about 75 percent by weight, preferably a minor amount, of solid filler particles of a phthalic acid. Isophthalic acid is the preferred filler.

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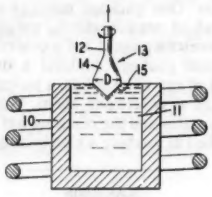
3,655,415

## ASTERIATED SYNTHETIC CORUNDUM GEM STONES AND METHOD AND APPARATUS FOR THEIR PRODUCTION

George A. Keig, El Cajon, Calif.; James C. Smith, Indianapolis, Ind., and John M. J. Watts, Poway, Calif., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 31, 1968, Ser. No. 788,255
Int. Cl. B01j *17/18*; C01f *7/02*; C04b *35/00*
U.S. Cl. 106—42 7 Claims



Asteriated synthetic corundum gem stones are provided which have their asteriating compounds as well as coloring compounds uniformly distributed throughout the body and which are free of the heavy banding characterizing previously made synthetic asteriated corundum gem stones. Method and apparatus for the production of these gem stones is also provided.

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3,655,416

## LIPID-PROTEIN MEMBRANE AND PROCESS

Leonard J. Vinson, Glen Rock, N.J., and Thomas Masurat, London, England, assignors to Lever Brothers Company, New York, N.Y.

Filed Dec. 18, 1968, Ser. No. 784,943
Int. Cl. C08h *1/06*, *7/06*
U.S. Cl. 106—155 3 Claims

A lipid-protein membrane having water vapor permeability characteristics similar to those of mammalian skin is produced by combining stratum corneum cells with an unsaturated fatty acid in controlled amounts in carbon tetrachloride to form an emulsion, casting the emulsion into a thin film on a smooth surface, and oxidizing the film to form a strong membrane having a lipid-to-protein ratio between the range of 1.25 to 2.5.

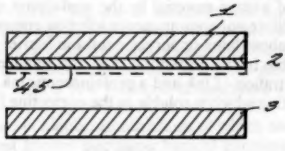
3,655,417
CLAY PROCESSING
John H. Chapman, Sandersville, Ga., assignor to Georgia Kaolin Company, Elizabeth, N.J.
Filed Mar. 2, 1970, Ser. No. 15,837
Int. Cl. C09c 1/42
U.S. Cl. 106—288 B 14 Claims

A method of bleaching discolored mineral comprising forming an aqueous slurry of said mineral, adding a small amount of water soluble sodium hypochlorite and a small amount of hydrogen peroxide to said slurry and then adding a water soluble hydrosulfite to said slurry.

3,655,418
PRODUCTION OF PIGMENTS
Clarence James Hardy, Wantage; Edward Sydney Lane, Didcot, and Mervyn John Hannam, East Hendred, all of England, assignors to United Kingdom Atomic Energy Authority, London, England
Filed Aug. 14, 1969, Ser. No. 850,217
Claims priority, application Great Britain, Aug. 20, 1968, 39,748/68
Int. Cl. C09c 1/24; C08h 17/04
U.S. Cl. 106—304 10 Claims

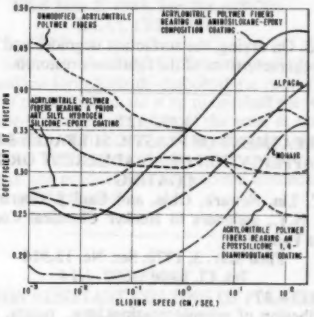
A route for the production of a black pigment comprises making an aqueous solution of iron and manganese salts and reacting it with a base in the presence of a protective colloid to produce a granular precipitate. The colloid is preferably in the base but it may also be in the salt solution.

3,655,419
ELECTROPHOTOGRAPHIC REVERSAL DEVELOPING PROCESS
Yasuo Tamai; Seiji Matsumoto, and Satoru Honjo, all of Asaka-shi, Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara-Kamigun, Kanagawa, Japan
Filed Nov. 12, 1969, Ser. No. 875,641
Claims priority, application Japan, Nov. 12, 1968, 43/82696
Int. Cl. G03g 13/08, 13/10
U.S. Cl. 117—17.5 8 Claims




An electrophotographic reversal developing process where a charged electrophotographic element exposed to an optically negative image on an image bearing member where the area of the negative image is not over 10 percent of the area of the image bearing member. The electrophotographic element is next disposed with respect to a developing electrode which is completely electrically insulated from its surroundings to thereby induce on said electrode a potential which causes an electric field to occur at the image portions of the whole electrostatic latent image which is oppositely directed from that occurring at the background portion which corresponds to the area of maximum charge density. Next, toner particles having a charge of the same polarity as that of the background portion are introduced between the developing electrode and the electrophotographic element to develop the image portions.

3,655,420
SYNTHETIC ORGANIC TEXTILE FIBER WITH IMPROVED, DURABLE, SOFT, LUBRICATED FEEL
Robert L. Tichenor, Waynesboro, Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Continuation-in-part of application Ser. No. 813,280, Apr. 3, 1969, now abandoned. This application Mar. 6, 1970, Ser. No. 17,205
Int. Cl. D06m 15/66; D06c 19/00
U.S. Cl. 117—138.8 A 5 Claims


UNMODIFIED ACRYLONITRILE POLYMER FIBERS
ACRYLONITRILE POLYMER FIBERS BEARING AN AMINOSILOXANE-EPOXY COMPOSITION COATING
ALPACA
MOHAIR
ACRYLONITRILE POLYMER FIBERS BEARING A FINISH ANT SULFL HYDROGEN SILICONE-EPOXY COATING
ACRYLONITRILE POLYMER FIBERS BEARING AN EPOXYSILICONE 1,4-DIAMINOBUTANE COATING
COEFFICIENT OF FRICTION
SLIDING SPEED (CM./SEC.)

Process comprising treating synthetic organic textile fibers with a finishing composition that is (1) a mixture of a polyepoxide and an aminosiloxane, (2) a mixture of an epoxysiloxane and a polyamine, or (3) a mixture of an epoxysiloxane and an aminosiloxane, and thereafter curing said composition by subjection to elevated temperature. The treated fibers possess a durable, soft, lubricated feel.

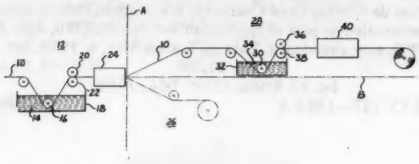
3,655,421
METHOD OF FORMING PATTERNS ON SUBSTRATE SURFACES
Fred E. Long, Stow, Ohio, assignor to The General Tire & Rubber Company
Continuation-in-part of application Ser. No. 758,145, Sept. 6, 1968, now abandoned. This application Aug. 18, 1969, Ser. No. 851,039
Int. Cl. B44d 1/16, 5/06
U.S. Cl. 117—45 10 Claims

This invention concerns a process of forming an aesthetically pleasing random pattern on the surface of a substrate comprising the steps of coating the surface with a retractable liquid, the retractable liquid having a surface tension that is at least about 2 dynes/centimeter above the critical surface tension of wetting of the surface and also concerns the articles produced by this process.

3,655,422
FIRE RETARDING TREATMENT
Leroy J. Goldbeck, Neenah, and Norbert L. Van Den Elzen, Hilbert, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Filed Sept. 18, 1970, Ser. No. 73,412
Int. Cl. B44d 1/46; C09k 3/28
U.S. Cl. 117—46 CA 4 Claims

A process is illustrated for rendering a water repellent fabric fire retardant without adversely affecting the fabric's water repellent characteristics. The water repellent fabric is treated with an aqueous medium containing a fire retarding

agent and a thermally degradable surfactant such as the diacetyl dilauryl amide derivative of triethylenetetramine and



then dried. On drying, the surfactant degrades and the water repellent characteristics of the fabric are restored.

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**3,655,423**

**PRETREATMENT OF PLASTIC SURFACES BEFORE THE APPLICATION OF AN ADHERENT ORGANIC COATING**

**Kingso C. Lin, Newark, Ohio, and Emil J. Geering, Grand Island, N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.**

**Filed Mar. 3, 1970, Ser. No. 15,916**
**Int. Cl. B44d** *1/092, 1/14*
**U.S. Cl. 117—47** **12 Claims**

The adhesion of organic coatings, e.g., paints, varnishes, dyes, and the like, to plastic substrates is improved by pretreating a plastic substrate with a reaction product of elemental phosphorus and a nucleophilic reagent or an organometallic compound. Following this pretreatment, which deposits a low oxidation state phosphorus compound at the plastic surface, the thus-treated surface is coated with an organic coating composition.

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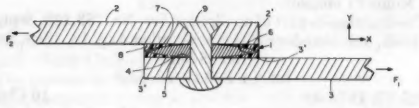
**3,655,424**

**ADHESIVE TAPE**

**Egon Orowan, Belmont, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.**

**Filed May 24, 1968, Ser. No. 731,769**
**Int. Cl. C09j** *7/02*
**U.S. Cl. 117—68.5** **17 Claims**



An adhesive tape embodying a core strip (preferably a metallic strip) and an adhesive upon the major surfaces of the strip. The cross section of the core has a substantially thick portion that diminishes in thickness towards the edges. In a preferred embodiment the edges are provided with fins that prevent the adhesive from being squeezed from between structural parts joined by the tape as the parts are drawn together by rivets, bolts, or the like.

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**3,655,425**

**CERAMIC CLAD FLAME SPRAY POWDER**

**Frank N. Longo, Ellwood, Huntington, and Mahesh S. Patel, Elmhurst, both of N.Y., assignors to Metco Inc.**

**Filed July 1, 1969, Ser. No. 838,319**
**Int. Cl. B44d** *1/094, 1/02*
**U.S. Cl. 117—100 M** **10 Claims**

A flame spray powder comprises finely-divided core particles of a metal or a metal alloy coated with discrete particles of a ceramic or cermet that remains in solid phase at least 100°F above the fusing or melting temperature of the metal. The average particle size of the ceramic is less than 25 percent of the average particle size of the metal and the amount used is insufficient to totally cover the surface of the metal particles so that on the average in the range of 5 to 75 percent of the surface area of the metal particles is exposed to ambient conditions.

When used in flame spraying, this new ceramic clad metal powderin one embodiment forms a flame spray coating where the ceramic is in the continuous phase and the coating is relatively soft and abradable, and in another embodiment the metal of the coating is in the continuous phase and the coating is relatively hard and erosion resistant.

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**3,655,426**

**PROCESS OF COATING METAL WITH POLYVINYL FLUORIDE AND RESULTANT PRODUCT**

**Otto Fuchs, Troisdorf-Oberlar, Germany, assignor to Dynamit Nobel Aktiengesellschaft, Troisdorf, near Cologne, Germany**

**Filed Oct. 27, 1969, Ser. No. 869,912**
**Claims priority, application Germany, Nov. 2, 1968, P 18 06 551.5**
**Int. Cl. B44d** *1/14;* **B32b** *15/08*
**U.S. Cl. 117—75** **15 Claims**

In the coating of metal with polyvinyl fluoride by applying a primer coat to the metal surface and applying a finish coat of polyvinyl fluoride over the primer coat, the improvement which comprises providing the primer coat by applying a mixture of basically reacting metal oxide and polyvinyl fluoride dissolved or suspended in an organic solvent, drying the primer coat, and applying on the primer coat, a coat of polyvinyl fluoride.

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**3,655,427**

**CORRECTABLE GRAPHIC SYSTEM**

**Walter J. Smith, Arlington, and John W. Rafferty, Marblehead, both of Mass., assignors to The Parker Pen Company, Janesville, Wis.**

**Filed Oct. 28, 1969, Ser. No. 871,971**
**Int. Cl. B32b** *25/06;* **B44d** *11/14, 5/04*
**U.S. Cl. 117—76 P** **1 Claim**

A correctable graphic system which will permit easy correction of written material by the application of a correcting fluid of dilute aqueous ammonia solution comprising: a paper base, a rubber latex or acrylic emulsion barrier coating which is insoluble in the correcting fluid and relatively resistant to the penetration of ink and a proteinaceous ink receptive surface coating which is soluble in the correcting fluid.

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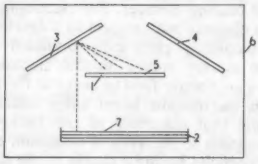
**3,655,428**

**COATING METALLIC MATERIALS**

**Adolphe Andre Bragard, Bressoux, Belgium, assignor to Centre National De Recherches Metallurgiques, Brussels, Belgium**

**Filed Jan. 2, 1970, Ser. No. 301**
**Claims priority, application Belgium, Jan. 2, 1969, 726,416**
**Int. Cl. C23c** *11/00*
**U.S. Cl. 117—106 R** **6 Claims**



In a low pressure enclosure ($10^{-1}$ to $10^{-5}$ Torr), a substance intended to serve as a coating is held at a temperature

at which it vaporizes. The material to be coated is disposed near the substance, at least part of the material being opposite the free surface of the substance. At least one screen is positioned in such a manner that at least part of the vaporized substance coming into contact with the screen is reflected from the screen towards parts of the material facing away from the free surface. The screen is held at a temperature at least equal to the melting temperature of the substance.

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**3,655,429**

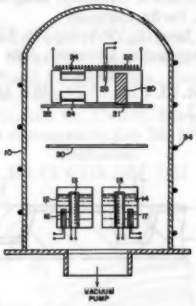
**METHOD OF FORMING THIN INSULATING FILMS PARTICULARLY FOR PIEZOELECTRIC TRANSDUCERS**

**John Deklerk, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Continuation-in-part of application Ser. No. 505,714, Oct. 29, 1965, now abandoned. This application Apr. 16, 1969, Ser. No. 816,486**

**Int. Cl. B44d** *1/18*

**U.S. Cl. 117—106** **6 Claims**



A film of an insulating compound is formed by evaporating constituent elements from sources screened by a baffle from the substrate while maintaining the substrate at a temperature at which individual elements will not deposit. II–VI, III–V and other compounds are so formed including compounds such as oxides. The film is stoichiometric and highly oriented when formed on a suitable substrate. Metal oxides, including those of zinc, silicon, magnesium, beryllium, titanium, zirconium and binary oxides such as lithium-gallium oxide, are formed with a low substrate temperature (at least −75° C.). Piezoelectric transducers, as well as other devices, may be so formed in highly oriented films of which zinc oxide offers the highest known electromechanical coupling coefficient.

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**3,655,430**

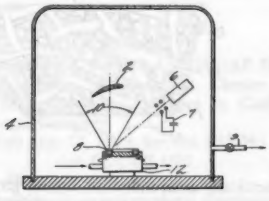
**VAPOR DEPOSITION OF ALLOYS**

**Wellington N. Greaves, Cromwell, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.**

**Filed May 21, 1969, Ser. No. 826,495**

**Int. Cl. C23c** *13/02*; **D21h** *1/18*; **C23c** *11/00*

**U.S. Cl. 117—107** **7 Claims**



In the coating of substrates with alloys containing elemental constituents characterized by significant differences in melting point and vapor pressure under the coating conditions, the material to be coated is provided as a plurality of individual elements comprising the coating constituents and the time-temperature relationship for each constituent in the melting cycle is adjusted to compensate for the varying degrees of difficulty in vaporizing the respective constituents.

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**3,655,431**

**CEILING TILE CARRYING ANTI-SAG COATING**

**Ronald Raymond House, Darien, Conn., assignor to American Cyanamid Company, Stamford, Conn.**

**Filed June 2, 1969, Ser. No. 829,706**

**Int. Cl. C03c** *25/02*

**U.S. Cl. 117—126 R** **7 Claims**

The sag resistance of ceiling tile of the "lay in" type coated with a melamine-formaldehyde-carbohydrate resin (wherein the weight of the carbohydrate is up to one-half the weight of the melamine-formaldehyde) is about the same as the sag resistance of ceiling tile coated with an all melamine-formaldehyde resin. The presence of carbohydrate permits a cheapening of the product and in preferred instances an improvement in performance.

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**3,655,432**

**ABRASION RESISTANT COATING OF POLYETHER POLYURETHANE**

**Robert W. Hausslein, Lexington, and Henry E. Molvar, Jr., Billerica, both of Mass., assignors to Amicon Corporation, Lexington, Mass.**

**Filed May 2, 1969, Ser. No. 821,472**

**Int. Cl. B44d** *5/00*; **B32b** *27/08, 23/08*

**U.S. Cl. 117—138.8 F** **5 Claims**

Abrasion resistant coatings for use on plastic articles which coatings are the cured reaction products formed of (1) a polyfunctional biuret formed of an aliphatic diisocyanate and water and (2) a polyethylene glycol. Plastic articles include acrylic, cellulose propionate and polycarbonate substrates. Preferred embodiments of the invention are those containing little or no solvent.

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**3,655,433**

**PLATABLE POLYMERS**

**Wassily Poppe; Habet M. Khelghatian, both of Springfield, Pa., and James E. Fitzpatrick, Naperville, Ill., assignors to Standard Oil Company, Chicago, Ill.**

**Continuation-in-part of application Ser. No. 732,545, May 28, 1968. This application July 6, 1970, Ser. No. 52,784**

**Int. Cl. B32b** *27/32*

**U.S. Cl. 117—138.8 E** **4 Claims**

In the art of electroplating nonconductive materials, adhesion of metal to the material is enhanced by incorporating into the material from 1 to 25 percent by weight of a metal resinate. Crystalline polyolefins, such as polyethylene, polypropylene and propylene-ethylene copolymer, are modified with calcium resinate, zinc resinate, aluminum resinate, sodium resinate, potassium resinate or ammonium resinate to improve the adhesion of metal thereto.

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**3,655,434**

**PROCESS FOR TREATING RUBBER SURFACES**

**Henry Van Stelten, 335 Skycrest Ave., La Habra, Calif.**

**Filed June 25, 1969, Ser. No. 836,637**

**Int. Cl. C08c** *17/24*

**U.S. Cl. 117—139** **2 Claims**

A process for treating the surfaces of rubber tires for vehicles comprising applying to said surfaces a composition containing, by weight:

| | |
|---|---|
| glycerine | 3–8% |
| alcohol | 20–30% |
| stabilizer | .05–5% |
| coloring agent | .01–1% |
| rust inhibitor | up to 2% |
| water | balance |

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**3,655,435**

**PROCESS FOR IMPARTING WATER-AND OIL-REPELLENT EMULSION FINISH FOR CELLULOSIC MATERIALS**

**William J. Connick, Jr., and Samuel E. Ellzey, Jr., both of New Orleans, La., assignors to The United States of America as represented by the Secretary of Agriculture**

**Original application July 20, 1967, Ser. No. 655,266, now Patent No. 3,518,218. Divided and this application May 27, 1969, Ser. No. 841,176**

**Int. Cl. D06m** *15/16*

**U.S. Cl. 117—139.5 A** **2 Claims**

A process is described for preparing a stable aqueous emulsion of a polymer derived from an alkyl perfluoralkanoate and an alkylenimine, employing 2.5–10 percent (based on total solvent weight) of a water-miscible polymer solvent, and special emulsifiers.

When fibrous cellulosic materials are treated with such emulsions using about from 1 to about 10 weight percent (based on the total emulsion weight) of the fluorinated ester, the resultant treated materials are rendered durably oleophobic and slightly hydrophobic. These desirable properties may be imparted by a simple drying step without resorting to a high temperature cure step.

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**3,655,436**

**METHOD OF IMPARTING SOIL RELEASE PROPERTIES TO FABRICS**

**Jean Dupre, Levittown, Pa.**

**Filed Oct. 14, 1969, Ser. No. 866,367**

**Int. Cl. D06m** *15/04*

**U.S. Cl. 117—139.5 C** **4 Claims**

A method for treating materials to facilitate removal of soil therefrom is disclosed, involving contacting the soiled material with a nitrogen-bearing starch adduct having a pKa value from about 3 to 8. Novel compositions which impart soil release properties to materials without causing soil redeposition from the wash liquor are also taught, comprising the said starch adducts.

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**3,655,437**

**PROCESS FOR TEXTILES WITH AQUEOUS LIQUORS OF POLYISOCYANATES AND SILICA SOLS**

**Gustav Becker, Leverkusen-Schlebusch; Heinz Griepentrog, Cologne; Wolfgang Klebert, and Friedrich Reich, both of Leverkusen, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany**

**Filed Mar. 27, 1969, Ser. No. 811,258**

**Claims priority, application Germany, Apr. 6, 1968, P 17 69 121.3**

**Int. Cl. C10m** *7/48;* **D06c** *29/00*

**U.S. Cl. 117—161 ZB** **5 Claims**

An improvement in the process of treating textile materials with aqueous compositions of polyisocyanate materials containing free-isocyanate groups is obtained by incorporating silica sol in the composition. The presence of the silica sol allows the compositions to be applied by the exhaustion method. Optionally, emulsion stabilizer, e.g., polymers of vinyl monomers can be added, as well as electrolytes which speed up drawing onto the textile fibers.

**3,655,438**

**METHOD OF FORMING SILICON OXIDE COATINGS IN AN ELECTRIC DISCHARGE**

**Henley Frank Sterling, Ware, England, and Richard Charles George Swann, North Palm Beach, Fla., assignors to International Standard Electric Corporation, New York, N.Y.**

**Continuation-in-part of application Ser. No. 452,487, May 3, 1965, now Patent No. 3,485,666. This application Oct. 20, 1969, Ser. No. 867,472**

**Int. Cl. H01b** *1/04;* **B44d** *1/34, 1/02*

**U.S. Cl. 117—201** **7 Claims**

This is a method of depositing a coherent solid layer of an oxide of silicon deposited upon a surface of a substrate by establishing a glow discharge adjacent to said surface in an atmosphere containing a gaseous compound of the element or elements comprising the material.

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**3,655,439**

**METHOD OF PRODUCING THIN LAYER COMPONENTS WITH AT LEAST ONE INSULATING INTERMEDIATE LAYER**

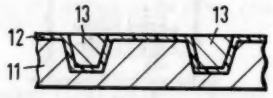
**Hartmut Seiter, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany**

**Filed June 16, 1969, Ser. No. 833,341**

**Claims priority, application Germany, June 19, 1968, P 17 69 627.4**

**Int. Cl. C23c** *13/24;* **H01l** *3/10*

**U.S. Cl. 117—212** **18 Claims**




Described is a method of producing thin layer components, separated by at least one insulating layer and comprised of semiconductor material, particularly silicon. The method is characterized by the fact that an amorphous layer of insulated material is pyrolytically precipitated on a substrate wafer, comprised of monocrystalline semiconductor material. The amorphous layer is converted into a monocrystalline layer by using the monocrystalline substrate and the thus formed substrate, which has a homogeneous crystallographic orientation, is used to grow another epitactic semiconductor layer, preferably of silicon.

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**3,655,440**

**ELECTRICAL RESISTANCE ELEMENTS, THEIR COMPOSITION AND METHOD OF MANUFACTURE**

**Lynn J. Brady, Edwardsburg, Mich., assignor to CTS Corporation, Elkhart, Ind.**

**Filed Mar. 3, 1969, Ser. No. 803,688**

**Int. Cl. H01b** *1/02, 1/08*

**U.S. Cl. 117—227** **21 Claims**

An electrically nonconductive crystal growth controlling agent comprising submicron inert particles is mixed with a crystalline conductive phase comprising an oxide of Rutheni-

um or Iridium, a vehicle, and a moisture impervious binder with which the inert particles will not react and in which the inert particles will not dissolve to any appreciable extent at elevated temperatures. After being applied to a high temperature-resistant, electrically nonconductive substrate, the composition is fired at elevated temperatures for a sufficient period of time to permit the crystals of the conductive phase to grow until an equilibrium condition is reached. This condition is determined in part by the crystal growth controlling agent. Upon cooling, the binder bonds together a composite mass comprising an inert intersticed matrix made up of the crystal growth controlling agent and the crystalline conductive phase which forms an interstitial mass within the interstices of the matrix. The method comprises the steps of thoroughly mixing the above-identified materials, applying a layer of the mixture to the substrate, and firing the substrate and layer of material for 45 to 60 minutes to a preferred peak temperature in the range of 975°–1025° C. During the firing cycle the crystals of the conductive phase increase in size until further growth is limited by the crystal growth controlling agent.

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**3,655,441**

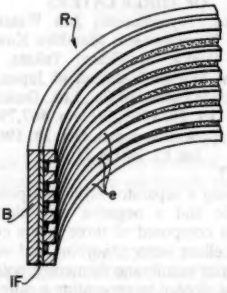
## ELECTROLESS PLATING OF FILAMENTARY MAGNETIC RECORDS

**John H. Kefalas, North Billerica, Mass., assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed Aug. 22, 1966, Ser. No. 574,147. The portion of the term of the patent subsequent to July 20, 1988, has been disclaimed.**

**Int. Cl. G11b** *5/84, 5/62*

**U.S. Cl. 117—237** **14 Claims**




A magnetic record having a non-magnetic substrate carrying information-storing tracks of magnetic material has a gelatinous material coating the substrate and particulate silver metal secured on the gelatinous material in accordance with the pattern of the recording tracks. The silver is provided in this pattern by coating the gelatinous material with a photographic emulsion that is subsequently exposed and developed according to the desired pattern of recording tracks.

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**3,655,442**

## METHOD OF MAKING SUGAR AND SUGAR PRODUCTS

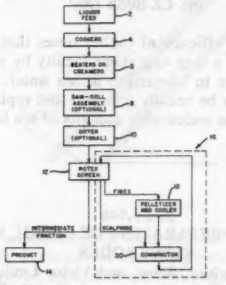
**Frederick W. Schwer, Orinda, and Chester E. Kean, Lafayette, both of Calif., assignors to California and Hawaiian Sugar Company**

**Filed Aug. 27, 1969, Ser. No. 853,361**

**Int. Cl. C13f** *1/02*

**U.S. Cl. 127—58** **3 Claims**

Process of making sugar and products containing predominantly sugar wherein sugar syrups are evaporated and then beaten to make a fondant-like material by a process wherein the crystallized product is screened to produce an intermediate, salable, fraction of the desired particle size, a coarse material (scalpings) and a fine material. The fine material is pelletized and combined with the coarse material and passed




through a comminutor and the comminuted product is returned to the screening stage. This produces a product having a particle size distribution within a narrow range which is free flowing and in practically 100 percent yield.

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**3,655,443**

## PROCESS FOR MAKING A BATTERMIX STARCH FOR BREADED DEEP FRIED FOODS

**Charles S. Campbell, Hammond, Ind., assignor to American Maize Products Company**

**Filed Dec. 10, 1969, Ser. No. 884,052**

**Int. Cl. C13l** *1/08*

**U.S. Cl. 127—70** **6 Claims**

A battermix starch having consistently high adhesion characteristics and a process for making the same are disclosed. The protein content of a commercial starch is adjusted to 0.7 percent or more by weight of the starch and the high protein starch is then modified by oxidative treatment.

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**3,655,444**

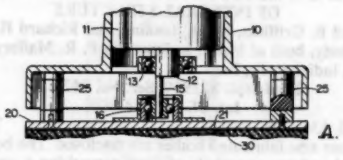
## METHODS AND MEANS FOR TREATING SURFACES

**Edward G. Young, Gloucester, Mass., assignor to C. T. & R. E., Inc., Danvers, Mass.**

**Filed Aug. 7, 1969, Ser. No. 848,210**

**Int. Cl. A47l** *11/34;* **B08b** *7/02*

**U.S. Cl. 134—6** **13 Claims**




Oscillatory-drive machine for cleaning rugs and hard surfaces. It employs in contact with the surface of a rug, tile or floor a layer of elastic material the working face of which has an irregular contour.

3,655,445

## METHOD FOR REMOVING SHELLFISHES AND CRUSTACEANS GREGARIOUSLY SETTLING ON RUBBER HOSES

Masaru Yamato, Tokyo, Japan, assignor to Idemitsu Kosan Co., Ltd., Tokyo, Japan

Filed July 30, 1969, Ser. No. 846,286
Claims priority, application Japan, Aug. 17, 1968, 43/58256
Int. Cl. B08b *7/00*
U.S. Cl. 134—42 1 Claim

Maintaining the efficacy of rubber hoses that are used to transport oil from a ship to a shore facility by wrapping the rubber hoses, prior to immersion in sea water, with a strip that can thereafter be readily removed and replaced once it has accumulated an undesirable quantity of sea life.

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3,655,446

## METHOD OF PREPARATION OF CUPRIC SULFIDE ELECTRODES

Gerard Marcel Gerbier, Biard, and Victor Louis Dechenaux, Poitiers, both of France, assignors to Societe Des Accumulateurs Fixes et de Traction (Societe Anonyme), Romainville, France

Filed July 8, 1970, Ser. No. 53,311
Claims priority, application France, July 11, 1969, 6923837
Int. Cl. H01m *35/02*
U.S. Cl. 136—23 21 Claims

An improved method of preparing cupric sulfide electrodes for electrochemical cells wherein the electrodes are made by preparing a first mixture comprising the total stoichiometric amount of copper required and about 25 to 35 percent by weight of the required stoichiometric amount of sulfur and heating this first mixture in a pre-sulfuration step to a temperature of between 120° and 160° C., then preparing a second mixture by adding to the product of the presulfuration step the complemental balance of the stoichiometric amount of required sulfur relative to the whole amount of copper or a slightly larger amount, compressing the second mixture in a mold under a pressure of from 0.25 to 2 t/cm$^2$ and heating the second mixture in a sulfuration step for about 15 hours to a temperature between 120° and 160° C., thereafter demolding and cooling the mold contents and then heating the cooled content now in form of an electrode again to a temperature of from 120° to 160° C. for about 10–15 hours to provide the cupric sulfide electrode.

The process avoids limitations of amounts of cupric sulfide that may be formed while avoiding ignition of the sulfur during sulfuration of the copper which ignition danger currently limits production to 20 gram batches.

Electrodes and electrochemical cells with such electrodes are also described.

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3,655,447

## MEANS AND METHOD FOR MAKING POROUS BODIES OF INTEGRAL STRUCTURE

Leonard B. Griffiths, North Reading, and Richard H. Krock, Peabody, both of Mass., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Sept. 8, 1969, Ser. No. 862,616
Int. Cl. H01m *41/00*
U.S. Cl. 136—30 7 Claims

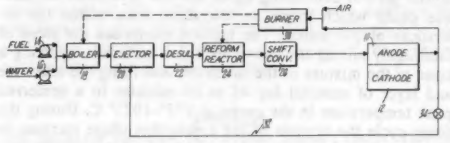
Porous zinc fabricated bodies are disclosed. The bodies are integral and are essentially of zinc, comprising a continuous network of interconnected pores formed by the zinc. Total porosities of greater than 50 percent are obtained through novel methods utilizing low temperature compaction. The structures are of high strength and good machinability and show interlocking rod shaped particles of zinc.

3,655,448

## HYDROGEN GENERATOR DESULFURIZER EMPLOYING FEEDBACK EJECTOR

Herbert J. Setzer, Ellington, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Original application Sept. 26, 1967, Ser. No. 670,640. Divided and this application May 22, 1969, Ser. No. 858,212
Int. Cl. H01m *27/00, 27/14*
U.S. Cl. 136—86 C 1 Claim




Water which is to be mixed with hydrocarbon fuel for feedstock in a hydrogen generator has low pressure hydrogen diffused therein so as to permit a hydrogen rich fuel-water admixture to enhance desulfurization of the admixture, without fuel sulfur poisoning of a diffuser. The hydrogen is fed back serially or in parallel from any point downstream of a steam reforming reactor.

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3,655,449

## DRY CELL COMPRISING A SEPARATOR COMPOSED OF THREE LAYERS

Shohei Yamamoto, Toyonaka-shi; Jun Watanabe, Osaka; Susumu Hosoi, Neyagawa-shi; Masahiro Kuwazaki; Akira Ota, both of Osaka; Toshikatsu Takata, and Junichi Asaoka, both of Moriguchi-shi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 20, 1969, Ser. No. 867,795
Claims priority, application Japan, Oct. 28, 1968, 43/80162
Int. Cl. H01m *21/00*
U.S. Cl. 136—107 12 Claims

A dry cell having a separator layer interposed between a positive electrode and a negative zinc electrode, which separator layer is composed of three layers consisting of a paper having excellent water absorbing and water retaining properties, a barrier membrane formed of polyvinyl alcohol alone or polyvinyl alcohol incorporating a material which has at least one of water absorbing property, water retaining property, swelling property and adhesive property, and a paste layer.

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3,655,450

## BATTERY ELECTRODE AND METHOD OF MAKING THE SAME

Luis A. Soto-Krebs, Santiago, Chile, assignor to ESB Incorporated

Continuation-in-part of application Ser. No. 445,904, Apr. 6, 1965. This application Sept. 2, 1970, Ser. No. 68,918. The portion of the term of this patent subsequent to Oct. 26, 1988, has been disclaimed.
Int. Cl. H01m *21/00*
U.S. Cl. 136—107 6 Claims

A battery electrode composed of a principal active material and a secondary active material and the method of making the same, which electrode will achieve the discharge potential characteristic of the secondary active material wherein the sole electronic path for discharge of principal active material is through the secondary active material. The discharge product of the secondary active material must be readily oxidized by the principal active material.

3,655,451

## METHOD OF MAKING AN ALKALINE IMPREGNATED ELECTRODE

**Raymond W. Blossom, Brooklyn, and Allen Charkey, Flushing, both of N.Y., assignors to Yardney International Corp., New York, N.Y.**

**Filed Apr. 14, 1969, Ser. No. 816,077**
**Int. Cl. H01m** *13/08, 43/02*
**U.S. Cl. 136—126** **4 Claims**

An improved method is described for manufacturing an electrode impregnated with potassium hydroxide. Potassium hydroxide in powder form having a low content of water is mixed with the anode metal in powder form and blended to form a coherent mixture. The mixture is spread over a conductive grid, subjected to a pressing operation to form a unitary structure of the desired electrode shape and then heated in the absence of air. The electrode is then stored in an airtight container. A strong KOH-impregnated metal anode capable of long storage is obtained.

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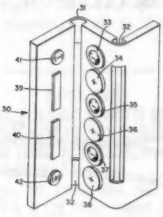
3,655,452

## BUTTON CELL BATTERY

**Everett Roy Cich, Monona, Wis., assignor to ESB Incorporated**

**Filed June 25, 1970, Ser. No. 49,661**
**Int. Cl. H01m** *21/00*
**U.S. Cl. 136—111** **5 Claims**



A button cell battery assembly is shown in which the button cells, in planar array, are electrically connected by pressure contact.

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3,655,453

## CATHODE MATERIAL FOR SOLID STATE BATTERIES

**Demetrios V. Louzos, Rocky River, and Geoffrey W. Mellors, Strongsville, both of Ohio, assignors to Union Carbide Corporation, New York, N.Y.**

**Filed July 16, 1970, Ser. No. 55,624**
**Int. Cl. H01m** *13/02, 15/06;* **C01c** *3/08*
**U.S. Cl. 136—121** **6 Claims**

The reaction product of elemental iodine and cyanides of zinc, cadmium or alkali metal produced by heating equimolar proportions of iodine and the cyanide at a temperature of about 220° C. in a sealed vessel in the absence of water is a good cathode material for solid electrolyte cells.

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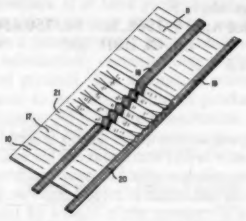
3,655,454

## PROCESS FOR PRODUCING A HOLLOW BODY OF NONDEVELOPABLE FORM FROM A STARTING MATERIAL OF A DEVELOPABLE FORM

**Giorgio Tangorra, Milan, Italy, assignor to Industrie Pirelli S.p.A.**

**Filed Jan. 13, 1970, Ser. No. 2,500**
**Claims priority, application Italy, Jan. 20, 1969, 11,737 A/69**
**Int. Cl. B29h** *7/03, 17/22*
**U.S. Cl. 156—132** **4 Claims**

A process for manufacturing a hollow body having a nondevelopable form from a single piece of starting material which is flexible and which is either flat or in a developable form. The process involves the formation of folds or corrugations in the starting material and the subsequent shaping of



same into a nondevelopable form with an accompanying unfolding of the corrugations thereby providing the additional length of material needed to satisfy the nondevelopable form.

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3,655,455

## METHOD FOR THE MANUFACTURE OF BATTERIES

**Kenneth R. Jones, Mequon, Wis., assignor to Globe-Union Inc., Milwaukee, Wis.**

**Original application July 16, 1964, Ser. No. 383,159, now Patent No. 3,431,148. Divided and this application Aug. 16, 1968, Ser. No. 777,932**
**Int. Cl. H01m** *31/00*
**U.S. Cl. 136—175** **6 Claims**

A method of encasing batteries where the battery electrodes are assembled with spacers maintaining the electrodes in a spaced relationship to define an electrolyte cavity. In practicing the method, the electrode assembly is immersed in a body of molten casing material whereby the casing material solidifies to form a web between the electrodes and define the electrolyte cavities. The supports for the assembly during immersion extend across the electrodes and are coated with casing material so that upon removal of the supports transverse tubular manifolds are defined. A single port to the manifold and the plurality of electrolyte cavities is also provided upon removal of the supports.

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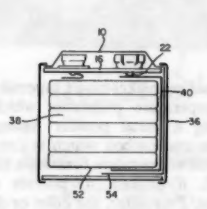
3,655,456

## DRY CELL BATTERY

**David O. Hamel, Madison, Wis., assignor to ESB Incorporated**

**Filed June 15, 1970, Ser. No. 46,429**
**Int. Cl. H01m** *5/04*
**U.S. Cl. 136—181** **3 Claims**



A dry cell battery is described characterized by having a terminal board with one or more electrical terminals mounted thereon and a terminal protector adhesively fastened to the terminal board.

## 3,655,457
## METHOD OF MAKING OR MODIFYING A PN-JUNCTION BY ION IMPLANTATION

Michael C. Duffy, Poughkeepsie; Paul A. Schumann, Jr., Wappingers Falls, and Tsu-Hsing Yeh, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 6, 1968, Ser. No. 750,650
Int. Cl. H01l 7/00
U.S. Cl. 148—1.5 31 Claims

Monolithic integrated circuits are made utilizing various ion implantation techniques for making diodes, transistors, resistors, capacitors, underpass connections, sub-collector junctions, etc., and for altering impurity profiles, gold doping, trimming resistance values, altering junctions depth, and isolating regions.

## 3,655,458
## PROCESS FOR MAKING NICKEL-BASED SUPERALLOYS

Steven H. Reichman, Ann Arbor, Mich., assignor to Federal-Mogul Corporation

Filed July 10, 1970, Ser. No. 53,870
Int. Cl. C22f 1/10; B22f 9/00, 3/14
U.S. Cl. 148—11.5 F 10 Claims

A process for making nickel-based superalloys that possess excellent high-temperature properties which includes the steps of providing a metal powder having a controlled amount of oxygen and carbon which is confined and densified at an elevated temperature forming a billet that can be further deformed, if desired, to provide an appropriate shaped component. Thereafter, the billet or deformed part is subjected to heat treatment to effect a growth in the grain size thereof to attain optimum physical properties, whereafter the alloy is carburized to increase the carbon content thereof to a level in excess of about 500 parts per million (ppm) which is performed in a manner so as to preferentially promote carbide formation at the grain boundaries of the alloy, thereby stabilizing the alloy against further grain growth when subjected to elevated temperatures during use.

## 3,655,459
## METHOD FOR PRODUCING MINIMUM-RIDGING TYPE 430 MO STAINLESS STEEL SHEET AND STRIP

Kenneth G. Brickner, O'Hara Township, Allegheny County, and George A. Ratz, Bethel Park, both of Pa., assignors to United States Steel Corporation

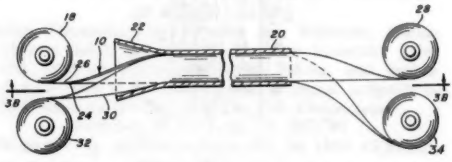
Filed Aug. 13, 1970, Ser. No. 63,612
Int. Cl. C21d 9/48
U.S. Cl. 148—12 4 Claims

A process for producing a Type 430 Mo stainless steel sheet product with substantially reduced ridging characteristics when drawn. Commencing in slab form, the Type 430 Mo steel is hot rolled at 2000°–2100°F and finished at below 1400°F, with a reduction of at least 30 percent per pass; box annealed at 1750-1850°F for at least 10 hours and then at 1450°–1500°F for at least 2 hours; cold rolled to final thickness; and continuous annealed at 1575°–1625°F.

## 3,655,460
## METHOD FOR HEAT TREATING METALLIC STRIP MATERIAL

John T. Hayden, Jr., Richmond, Va., and Casimir F. Plasewicz, Baltimore, Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 24, 1970, Ser. No. 49,430
Int. Cl. C21d 1/34
U.S. Cl. 148—13.1 7 Claims




A method for heat treating metallic strip stock in cylindrical form by drawing the strip stock through a funnel-shaped element and then through a heated tube, characterized in that a protective sheet is passed through the heated tube along with the metallic strip stock to be heat treated such that it encircles and envelops the cylindrical form to be heat treated and prevents damage to its outer surface due to frictional drag between the heated tube and the cylindrical form passing therethrough.

## 3,655,461
## FLUX FOR ALUMINUM SOLDERING

Keiji Miwa, Gifu, Japan, assignor to Sanyo Electric Works Ltd., Gifu, Japan

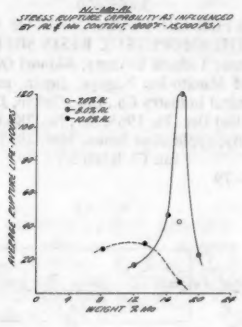
Continuation-in-part of application Ser. No. 741,217, June 28, 1968, now abandoned. This application Sept. 2, 1970, Ser. No. 69,131
Int. Cl. B23k 35/34
U.S. Cl. 148—23 11 Claims

A flux for soldering aluminum and other nonferrous metals and iron to the same or different metals comprising 50–70 percent epoxide resin, 15–30 percent rosin, 12–18 percent triethanolamine and 3–5 percent of a heavy metal fluoroborate or boron trifluoride monoethylamine and optionally an aromatic amine or amide.

## 3,655,462
## CAST NICKEL-BASE ALLOY

**Douglas H. Maxwell, Monsey, N.Y., assignor to United Aircraft Corporation, East Hartford, Conn.**

**Original application Feb. 19, 1969, Ser. No. 800,591. Divided and this application Mar. 22, 1971, Ser. No. 126,802**
**Int. Cl. C22c *19/00***
**U.S. Cl. 148—32.5** **2 Claims**




A cast nickel-base alloy having outstanding utility in very high temperature application at a composition consisting essentially of, by weight, 17.5–18.5 percent molybdenum, 7.75–8.25 percent aluminum, up to 0.05 percent carbon, balance nickel.

## 3,655,463
## SINTERED COBALT-RARE EARTH INTERMETALLIC PROCESS USING SOLID SINTERING ADDITIVE

**Mark G. Benz, Burnt Hills, N.Y., assignor to General Electric Company**

**Filed Apr. 30, 1970, Ser. No. 33,348**
**Int. Cl. B22f *3/00*; H01f *1/08***
**U.S. Cl. 148—101** **16 Claims**

A process for preparing novel sintered cobalt-rare earth intermetallic products which can be magnetized to form permanent magnets having stable improved magnetic properties. A particulate mixture is formed of a base CoR alloy and an additive CoR alloy, where R is a rare earth metal. The base CoR alloy is one which, at sintering temperature, exists as a solid $Co_5R$ intermetallic single phase. The additive CoR alloy is richer in rare earth metal than the base CoR alloy, and at sintering temperature is solid. The base and additive alloys, in particulate form, are each used in an amount to form a mixture which has a cobalt and rare earth metal content substantially corresponding to that of the final desired sintered product. The mixture is pressed into compacts and sintered to the desired sintered product phase composition and density. At sintering temperature, the final sintered product has a phase composition lying outside the $Co_5R$ single phase on the rare earth richer side. Specifically, the final sintered product contains a major amount of the $Co_5R$ solid intermetallic phase and up to about 35 percent by weight of the product of a second solid CoR intermetallic phase which is richer in rare earth content than the $Co_5R$ phase.

## 3,655,464
## PROCESS OF PREPARING A LIQUID SINTERED COBALT-RARE EARTH INTERMETALLIC PRODUCT

**Mark G. Benz, Burnt Hills, N.Y., assignor to General Electric Company**

**Filed Apr. 30, 1970, Ser. No. 33,347**
**Int. Cl. B22f *3/00*; H01f *1/08***
**U.S. Cl. 148—101** **16 Claims**

A process for preparing novel sintered cobalt-rare earth intermetallic products which can be magnetized to form permanent magnets having stable improved magnetic properties. A particulate mixture is formed of a base CoR alloy and an additive CoR alloy, where R is a rare earth metal. The base CoR alloy is one which, at sintering temperature, exists as a solid $Co_5R$ intermetallic single phase. The additive CoR alloy is richer in rare earth metal than the base CoR alloy, and at sintering temperature is at least partly liquid. The base and additive alloys, in particulate form, are each used in an amount to form a mixture which has a cobalt and rare earth metal content substantially corresponding to that of the final desired sintered product. The mixture is pressed into compacts and sintered to the desired sintered product phase composition and density. At sintering temperature, the final sintered product has a phase composition lying outside the $Co_5R$ single phase on the rare earth richer side. Specifically, the final sintered product contains a major amount of the $Co_5R$ single phase on the solid intermetallic phase and up to about 35 percent by weight of the product of a second solid CoR intermetallic phase which is richer in rare earth content than the $Co_5R$ phase.

## 3,655,465
## HEAT TREATMENT FOR ALLOYS PARTICULARLY STEELS TO BE USED IN SOUR WELL SERVICE

**Edwin Snape, Monsey, N.Y., and Frank W. Schaller, Ringwood Passaic, N.J., assignors to The International Nickel Company, Inc., New York, N.Y.**

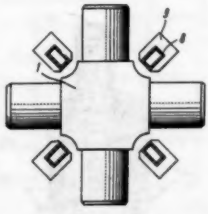
**Filed Mar. 10, 1969, Ser. No. 805,827**
**Int. Cl. C21d *1/18***
**U.S. Cl. 148—134** **26 Claims**

Steel characterized by high yield strength, e.g., over 90,000 p.s.i., is rendered greatly less susceptible to Sulfide Corrosion Cracking in sour oil wells or comparable environments through the use of a sequence of heat treating operations in which the steel is heated within its $A_{c1}$ and $A_{c3}$ region and thereafter heated below its $A_{c1}$ temperature.

## 3,655,466
## UNIVERSAL JOINT CROSS OF POWER TRANSMISSIONS AND A METHOD OF ITS HEAT TREATMENT

**Grigory Arkadievich Ostrovsky, Delegatskaya ulitsa, 14/2, kv. 21; Anatoly Georgievich Orlovsky, Simferopolsky, bulvar, 12/14, korpus 1, kv. 26; Vladimir Filippovich Nikonov, Avtozavodskaya ulitsa, 7 kv. 116; Veniamin Davydovich Kalner, Lomonosovksy prospekt, 15, kv. 137; Isaak Nokhimovich Shklyarov, Simonovsky val, 26, Korpus, 2, kv. 94; Anatoly Loginovich Stepin, ulitsa Shumkina, 2/24, kv. 2; Alexandr Moiseevich Bysink, Leninsky prospekt, 32, kv. 272; Konstantin Zakharovich Shepelyakovsky, Avtozavodskaya, ulitsa, 6, kv. 125, and Stanislav Ivanovich Smirnov, ulitsa Novinki, 23, korpus 2, kv. 24, all of Moscow, U.S.S.R.**

**Filed Oct. 31, 1969, Ser. No. 872,889**
**Claims priority, application U.S.S.R., Oct. 31, 1968, 1279470**
**Int. Cl. C21d *1/18***
**U.S. Cl. 148—145** **5 Claims**



A universal joint cross for power transmissions, said cross including a base having arms adapted to be engaged by bear-

ing needles, said cross being made of a steel consisting essentially of 0.4 to 1.2 percent carbon and 0.1 to 0.3 percent manganese, the surface hardness of the arms at their points of contact with said bearing needles being in the range of 60 to 67 Rockwell C, and at the points near the base being in the range of 50 to 56 Rockwell C. The method of heat treatment comprises the steps of heating said cross to its hardening temperature, cooling said cross to obtain a hardened surface layer and then nonuniformly tempering said cross.

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**3,655,467**

**ETCHING OF ALUMINUM BASE ALLOYS**

**Albert L. Sopp, Jr., New Kensington, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.**

**Filed May 14, 1969, Ser. No. 824,691**
**Int. Cl. C23g *1/22, 1/26***
**U.S. Cl. 156—22** **4 Claims**

Treating aluminum base alloys with a cleaning-etching solution made up of a caustic and a soluble pyro- or polyphosphate to inhibit formation of an undesirable film thereon.

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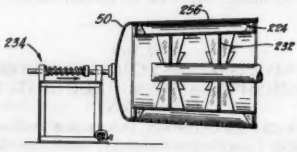
**3,655,468**

**FLUID-HANDLING CONSTRUCTIONS, APPARATUS AND METHODS OF PRODUCTION**

**Andrew L. Bastone, Granville; Justin R. Boeker, Newark, both of Ohio, and Fred E. Klimpl, West Orange, N.J., assignors to Owens-Corning Fiberglas Corporation**

**Original application Aug. 6, 1964, Ser. No. 387,945, now Patent No. 3,412,891, dated Nov. 26, 1968. Divided and this application Apr. 13, 1970, Ser. No. 22,431**
**Int. Cl. B32b *17/04***
**U.S. Cl. 156—62.2** **8 Claims**




Production of large underground corrosion resistant storage tanks, e.g., 10,000 gallon capacity, from a normally mobile resin and chopped reinforcement Ability to "hold" the rein in place until it cures is provided by a stabilizing mat layer or medium.

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**3,655,469**

**PROCESS FOR FORMING A DECORATIVE STRUCTURE**

**Josephine E. Huron, 5527 W. 78th St., Los Angeles, Calif.**

**Filed May 19, 1969, Ser. No. 825,701**
**Int. Cl. B31f *1/08*; B32b *31/20*; B44c *1/20***
**U.S. Cl. 156—63** **14 Claims**

A process for forming a decorative structure wherein crimped elongate strips of thin papery material are wet with a water-based paste and applied to a base to form a coating thereon. The coated base is heated at an elevated temperature below a bake temperature for a time sufficient to cause shrinkage of applied material but insufficient to dry the applied material, and is then heated at a bake temperature for a time to substantially dry the applied material, whereupon a lacquer coating is applied.

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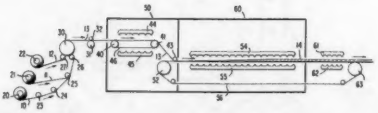
**3,655,470**

**PROCESS FOR THE PRODUCTION OF A FOAMED THERMOPLASTIC RESIN SHEET**

**Akio Takeshima; Tadashi Ueyama; Akinori Ohki, and Tetsuo Mori, all of Minato-ku, Nagoya, Japan, assignors to Toa Gosei Chemical Industry Co., Ltd., Tokyo, Japan**

**Filed Dec. 16, 1968, Ser. No. 784,001**
**Claims priority, application Japan, Mar. 29, 1969, 44/24050**
**Int. Cl. B32b *5/18***
**U.S. Cl. 156—79** **6 Claims**



Process for continuously producing a foam sheet by heating a continuous sheet of a soft thermoplastic synthetic resin, said sheet prepared by a calendering process, which contains a chemical foaming agent at a temperature lower than the decomposition temperature of said chemical foaming agent eliminating the internal stress of said sheet elongating a corrugation formed on the sheet during said heating in the direction of the width thereof, and then heating at a temperature higher than the decomposition temperature of said chemical foaming agent to foam said sheet.

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**ERRATUM**

For Class 156—132 see:
Patent No. 3,655,454

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**3,655,471**

**METHOD OF PRODUCING A FIBROUS SHEET COMPOSITION**

**Lawrence W. Healy, P.O. Box 504, Johnsonville, S.C.; Wu Lan Wang, 298 Crafton Ave., Newark, N.J., and Tsu-Huai Wang, 17 Paisley Drive, Wilmington, Del.**

**Continuation-in-part of application Ser. No. 562,532, July 5, 1966,. This application Aug. 28, 1970, Ser. No. 68,010**
**Int. Cl. B32b *31/12***
**U.S. Cl. 156—148** **7 Claims**

Leather like compositions are produced by needling a fleece into a foam, compressing resulting product, depositing an elastomer into the compressed product, again compressing and optionally coating.

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**3,655,472**

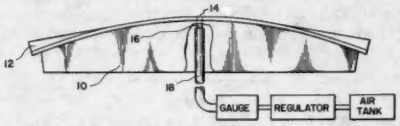
**METHOD OF MAKING HIGH BRIGHTNESS REFLECTION SCREENS**

**Jasper S. Chandler, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Sept. 16, 1969, Ser. No. 858,328**
**Int. Cl. B29c *17/00***
**U.S. Cl. 156—156** **5 Claims**

High brightness reflection screens of the type described in U.S. Pat. No. 3,408,132 can be formed to the required curva-

ture from nonself-supporting aluminum foil without the use of rigid molds by employing air pressure in the manner




described to inflate the foil. The aluminum foil is made self-supporting with resin and resin reinforcing materials.

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**3,655,473**

## PRE-SPLICE FILM CLEANER

**Robert J. O'Brien, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Oct. 2, 1969, Ser. No. 863,206**
**Int. Cl. B65h** *69/06*
**U.S. Cl. 156—157** **2 Claims**

Photographic film is conditioned, say for splicing, by means of a brief intense flash of broad band light. The invention is especially useful in making durable splices of pre-processed film: Whereas prior art splicing of pre-processed film is from "emulsion side-to-emulsion side," flashing according to the invention causes the ordinarily hard, and smooth, rem-jet side of pre-processed film not only to be cleaned, but in addition fuses the rem-jet to the film base, and so conditions the rem-jet that it becomes an amorphous matte to which splice material may be secured easily. The rem-jet—except that thereof which was flashed—is dissolved away during film processing.

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**3,655,474**

## METHOD OF PRODUCING SHRINK-STABILIZED COMPOSITE FABRICS

**Thomas T. Constantine, South Easton, Mass., assignor to Fabric Research Laboratories, Dedham, Mass.**

**Filed Sept. 19, 1969, Ser. No. 859,452**
**Int. Cl. B32b** *5/00*
**U.S. Cl. 156—178** **13 Claims**

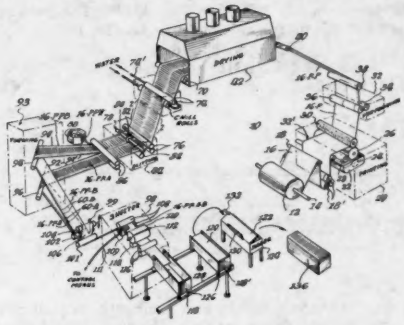
The disclosure relates to the shrink-stabilization of laminated and bonded fabrics, herein referred to as composite fabrics, by mechanical compressive shrinkage techniques adapted especially to handle the composite material. The disclosure also relates in part to a new product, in the form of a shrink-stabilized composite fabric. In the disclosed process, a mechanically settable thermoplastic tricot backing fabric is bonded to a desired outer or shell fabric to form the composite. The composite is mechanically compressively shrunk in a two roll compactor, including a feeding roll and a retarding roll. The composite fabric is so oriented relative to the compacting apparatus that the tricot backing fabric contacts the retarding roll, and the relationship of peripheral speeds of the feeding and retarding rolls is such as to effect longitudinal upsetting of the knitted loops of the backing material, confined wholly within the lengths of the loops to avoid pleating of the fabric. The mechanical compressive shrinkage operation is so carried out that the settable backing fabric material is semi-permanently set in an upset condition, at least partly by reason of self-generated heat of formation, resulting from the mechanical compacting operation. The new product, in addition to having a desirable stabilization against excess shrinkage, has a noticeably improved hand, as compared to the same material prior to processing, rendering the processed composite fabric more attractive for many applications, particularly garments.

**3,655,475**

## METHOD OF AND APPARATUS FOR MAKING HONEYCOMB CORE

**Walter R. Stelling, Jr., Wauwatosa, Wis.; Burton L. Siegal, Skokie, Ill., and Michael M. Talbott, Key Biscayne, Fla., assignors to Orbitex, Inc., Miami, Fla.**

**Filed May 26, 1969, Ser. No. 827,781**
**Int. Cl. B31d** *3/02*
**U.S. Cl. 156—197** **30 Claims**



A web of thin flexible material such as resin-impregnated cloth suitable for making expanded honeycomb core structures is drawn from a roll, the web being somewhat more than twice the width of the lay-up which is intended to be made. The double web passes through a printing station at which only one face has transverse lines of adhesive imprinted thereon. Each line extends only half-way across the web, and the lines on one half of the web are staggered along the length of the web with respect to the lines on the other half by a constant spacing. The web is slit into two halves, each being approximately one half of the width of the original double web. From the cutting station the two half webs pass over a pair of spaced turning bars which change the direction of movement of the respective half webs so that they are aligned edge to edge but with both printed faces in the same orientation so that the face of the bottom web engages the back of the top web.

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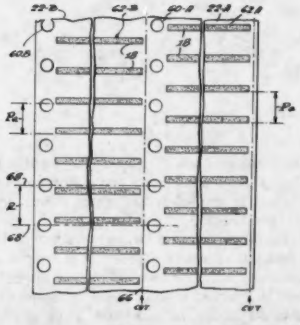
**3,655,476**

## METHOD OF MAKING HONEYCOMB CORE

**Burton L. Siegal, Skokie, Ill., assignor to Orbitex, Inc., Miami, Fla.**

**Filed May 26, 1969, Ser. No. 827,782**
**Int. Cl. B31d** *3/02*
**U.S. Cl. 156—197** **15 Claims**



Two webs are imprinted with transverse lines of adhesive, the pattern on one web being staggered with respect to the

pattern on the other web, so that if properly cut and stacked, there can be formed a lay-up which may eventually be expanded to produce honeycomb core.

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**3,655,477**

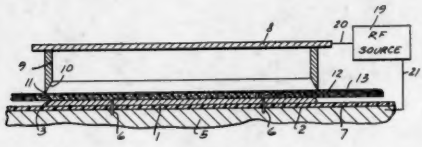
**METHOD OF MAKING HEAT-SEALED ARTICLES**

**Carl W. Scholl, and Milo L. Raffaelli, Sr., both of Chicago, Ill., assignors to The Scholl Mfg. Co., Inc., Chicago, Ill.**

**Original application Jan. 4, 1967, Ser. No. 607,247, now Patent No. 3,520,755, dated July 14, 1970. Divided and this application Feb. 12, 1970, Ser. No. 10,808. The portion of the term of this patent subsequent to July 14, 1987, has been disclaimed.**

**Int. Cl. B31f *1/00*; B23k *9/00***

**U.S. Cl. 156—202** **1 Claim**




A method of electronically heat sealing thermoplastic flexible cover material to a more rigid backing member to form a panel-like article, the method being such that the article is shaped over the side edge of the backing member and heat-sealed to that side edge, leaving only the rear face of the backing member exposed.

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**3,655,478**

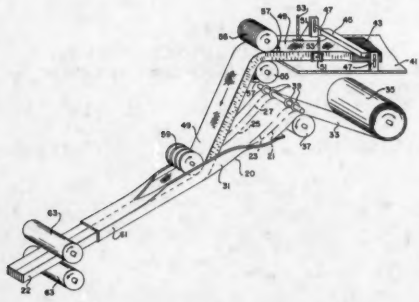
**CELLULAR STRUCTURAL PRODUCTS**

**Robert C. Geschwender, 1800 Center Park Road, Lincoln, Nebr.**

**Continuation of application Ser. No. 769,165, Oct. 21, 1968, now abandoned, which is a division of application Ser. No. 671,864, Sept. 29, 1967, now Patent No. 3,587,479. This application Aug. 10, 1970, Ser. No. 62,625**

**Int. Cl. B31f *1/00***

**U.S. Cl. 156—202** **6 Claims**



A cellular plank is made by continuously pulling a band of cellular material from a supply of the material. As the band is pulled, adhesive is applied to its upper, lower and sidewise faces. It is then directed into a folder which also receives a strip of wrapping material from a supply. Before the wrapping material enters the folder, it is scored along lines which will register with the four corners of the cellular band. The width of the scored strip is equal to the perimeter of an orthogonal cross section of said band. Then as the band and the wrapper pass through the folder, the latter is wrapped about the former so as to be adhered to it by means of the adhesive. After the combined material leaves the folder and the adhesive has set, it is in the form of a wrapped plank which is then cut into appropriate lengths for structural use. A preferred form is that of a block. In some cases several strips are employed for wrapping the blocks but in any event the wrapper covers the top, bottom and two sides of the block leaving the end faces open. The preferred form of cellular material is of the honeycomb type, although it is contemplated that a polyurethane or other like foam material may also be employed.

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**3,655,479**

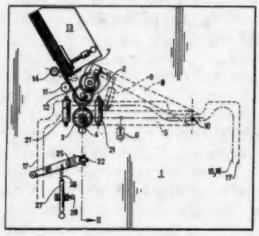
**METHOD FOR GLUING A STRIP OF MATERIAL AGAINST THE SIDE OF A FLAT WORK PIECE, LIKE A TABLE LEAF, AND A DEVICE FOR PEFORMING THIS METHOD**

**Gerardus P. Helmes; Wilhelmina P. M. Helmes; Christiaan T. Helmes; Johan P. H. Helmes, and Franciscus J. Helmes, all of Steyl-Tegelen, Netherlands, assignors to Helmes Machinefabriek N.V., Steyl, Netherlands**

**Filed Mar. 27, 1969, Ser. No. 811,098**

**Int. Cl. B29c *17/02***

**U.S. Cl. 156—212** **9 Claims**



Apparatus for applying an adhesive strip to a peripherally irregularly contoured edge of a panel by moving the panel contiguously passed an adhesive strip applicator roller. The panel is held in broadside relation on a centerless table capable of rotatable rectilinear and general plain motions which is supported by and shiftable on a bed. A cam having a contour conforming substantially to the peripherally irregularly contoured edge of the panel is carried by the table. The table is driven by driving and pressure rollers which engage the cam and rotate at a constant angular speed. Thus, the irregularly contoured periphery of the panel is movable past the applicator at varying surface speeds to ensure equal pressure application of the adhesive along the entire periphery of the panel.

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**3,655,480**

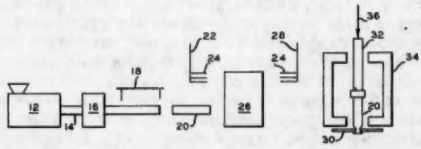
**HEATING PARISON PREFORMS IN LIQUID FLUORINATED ORGANIC COMPOUND**

**Richard K. Young, Bartlesville, Okla., assignor to Phillips Petroleum Company**

**Filed Aug. 18, 1969, Ser. No. 850,782**

**Int. Cl. B29c *17/07*, *17/14*; B29f *3/08***

**U.S. Cl. 156—256** **7 Claims**



Parison preforms are heated to orientation temperature in a liquid fluorinated organic compound bath. The thus heated

parisons can be sealed, stretched and blow molded to give oriented hollow articles such as bottles.

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3,655,481
**ADHERING RESINS TO SUBSTRATES, ESPECIALLY METAL, BY RADIATION**

**Roger P. Hall, Mayfield Heights, Ohio, assignor to SCM Corporation, New York, N.Y.**

**Continuation-in-part of application Ser. No. 682,140, Nov. 13, 1967, and a continuation-in-part of 737,576, June 17, 1968. This application Oct. 3, 1968, Ser. No. 764,963**
**Int. Cl. B29c** *27/04*
**U.S. Cl. 156—272** **15 Claims**

A process for coating by radiation a substrate, and especially one having a metallic surface, with a substantially catalyst-free system containing a polymerizable organic unsaturated resin susceptible to free-radical catalysis; and the resulting product. In one form, a film of the resin is superimposed upon the substrate while a facing side of either the resinous film or substrate is contacted at any time prior to such radiation with a selected chromium Werner complex. The Werner complex has a polar moiety attractive to the substrate and an organic unsaturated moiety which is sufficiently responsive to high energy radiation to react chemically with the resin. Thereafter, the film and substrate are subjected to the high energy radiation to adhere one to the other.

The process is also adapted for coating articles with normally air-inhibited, thermosetting resins by a two-step process, wherein the resin film is first passed through one treating zone effective to impart mass integrity and thereby define a sheet, and the sheet together with the Werner complex and the substrate is then passed through another treating zone effective substantially to complete the cure of the resin and simultaneously adhere the sheet to the substrate, at least one of the treating zones comprising exposure to high energy radiation.

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3,655,482
**BONDING METHOD AND PRODUCT**

**Sid I. Schildkraut, Flushing; Albert L. Yates, Huntington Station, and Peter J. Cohn, New York, all of N.Y., assignors to Edo Corporation, College Point, N.Y.**

**Filed Dec. 23, 1969, Ser. No. 887,775**
**Int. Cl. B32b** *31/00*
**U.S. Cl. 156—276** **5 Claims**

A process for adhering smooth mechanical surfaces via an intermediate adhesive of a predetermined thickness includes mixing spherical particles of a size comparable to the desired thickness with the adhesive. The adhesive-particle mixture is deposited between the surfaces and the adhesive cured, sufficient pressure being applied to effect only a single plane of the particles.

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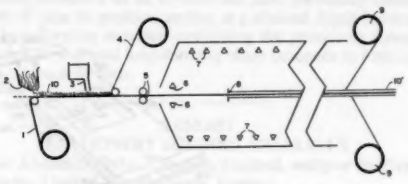
3,655,483
**PROCESS OF MANUFACTURING STRATIFIED MATERIALS OF GLASS FIBERS AND POLYESTERS USING ULTRA-VIOLET IRRADIATION**

**Philippe Borrel, and Jean Lehureau, both of Lyon, France, assignors to Progil, Paris, France**

**Filed June 10, 1970, Ser. No. 45,007**
**Claims priority, application France, June 12, 1969, 6919610**
**Int. Cl. B32b** *27/16;* **C08f** *1/20*
**U.S. Cl. 156—272** **7 Claims**

A laminate of improved properties is obtained by photopolymerization of a polyester in two stages including an intense but brief first stage and a longer less intense second stage, whereby the ethylenically unsaturated monomer migrates in part to the surface of the laminate.



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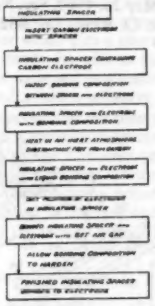
3,655,484
**METHOD FOR FUSING CARBON ELECTRODES AND INSULATING SPACERS USED IN ELECTRIC OVERVOLTAGE ARRESTERS**

**Vinayak K. Patel, Chicago, Ill., assignor to Cook Electric Company, Morton Grove, Ill.**

**Filed Oct. 15, 1969, Ser. No. 866,495**
**Int. Cl. B29c** *1/08*
**U.S. Cl. 156—293** **4 Claims**



An improved process for fusing a carbon electrode to an insulating spacer is provided for use in making a component for electric overvoltage arresters. The improved process involves heating an insulating spacer, a carbon electrode and a bonding composition used to fuse the electrode to the spacer in an inert atmosphere substantially free from oxygen until the bonding composition is liquefied, setting the position of the electrode in the insulating spacer while the bonding composition is in a liquid condition, and then allowing the bonding composition to harden so that the electrode is permanently secured within the spacer.

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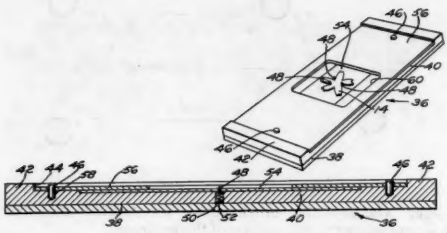
3,655,485
**PROCESS OF LAMINATING A VINYL DESIGN TO A VINYL BACKING SHEET**

**Thomas A. Zompa, East Providence, R.I., assignor to Trina, Inc., Fall River, Mass.**

**Filed June 9, 1969, Ser. No. 831,432**
**Int. Cl. B32b** *31/26*
**U.S. Cl. 156—256** **7 Claims**

A process of laminating a vinyl design to a vinyl backing sheet comprising the steps of first die cutting the design to the desired configuration, then placing the cut vinyl design on a support surface, then placing the vinyl backing sheet over the cut design so that the latter is properly oriented with

respect to the former, then applying heat and pressure to the surface of the backing sheet opposed from the surface with



which the cut design is in contact in order to fuse the cut design to the backing sheet.

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**3,655,486**

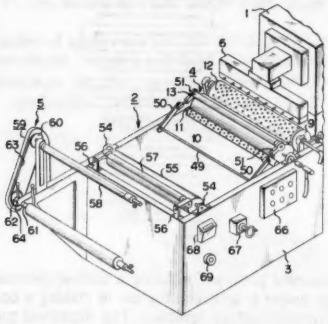
**APPARATUS FOR PRODUCING THERMOPLASTIC SYNTHETIC RESIN LAMINATED MATERIAL HAVING A LARGE NUMBER OF INDEPENDENT AIR CELLS**

**Seiji Hagino, Nagoya-shi; Kohei Masuda, Yokkaichi-shi; Kazumasa Hasegawa, Yokkaichi-shi; and Yasuzi Hosono, Yokkaichi-shi, all of Japan, assignors to Hagino Kiko Company Limited, Nagoya-shi and Mitsubishi Petrochemical Company Limited, Tokyo-to, Japan**

**Filed May 26, 1969, Ser. No. 827,657**

**Int. Cl. B29j** *1/00;* **B32b** *3/30*

**U.S. Cl. 156—360** **6 Claims**



Production of thermoplastic synthetic resin laminated material having a large number of independent air cells, the method comprising steps of extruding two sheets of filmy molten resin, engaging one of the sheets of filmy molten resin onto an endless molding belt, which has a large number of independent holes, and before the filmy molten resin sheets harden, applying a suction to the one filmy molten resin sheet corresponding to the holes of the endless molding belt, and bonding the other sheet of filmy molten resin on the flat side of the one of the filmy molten resin sheets, the product may be used for packing or buffering of articles.

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**3,655,487**

**HEAT SEALING APPARATUS**

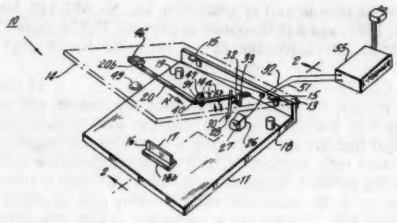
**Robert D. Farkas, 5601 First Ave., Brooklyn, N.Y.**

**Filed Mar. 9, 1970, Ser. No. 17,373**

**Int. Cl. B29c** *27/02;* **B32b** *31/16*

**U.S. Cl. 156—380** **11 Claims**

Apparatus for heat sealing sheets of thermoplastic material is constructed with a Nichrome strip constituting the heated die element. The die strip is mounted to the movable press element, with one end fixedly secured thereto, and the other end of the strip being free to move longitudinally as the strip temperature increases. The motion of the strip is transmitted through a motion multiplying linkage to operate a movable contact out of engagement with a stationary contact when the strip has reached a predetermined temperature, which will occur after sufficient heat for sealing has been applied



and prior to the application of excessive heat. The movable contact is automatically latched in the open position to maintain the flow of heating power to the strip interrupted at the end of the sealing operation. The latch releases the movable contact when the cooled strip is moved out of sealing position so that when the strip is next moved to sealing position the movable contact automatically engages the stationary contact to complete the heating circuit for the strip.

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**3,655,488**

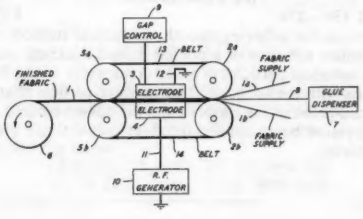
**APPARATUS FOR JOINING SHEET MATERIAL**

**Milton Goldstein, Yonkers, N.Y.; George R. Hair, Clifton, N.J.; Jack Kutzenco, Westfield, N.J., and Jacques J. Marchand, Newark, N.J., assignors to Bondit Corp., Rahway, N.J.**

**Original application July 7, 1967, Ser. No. 653,787, now Patent No. 3,575,760, dated Apr. 20, 1971. Divided and this application June 18, 1969, Ser. No. 871,158**

**Int. Cl. B29c** *27/10;* **B65c** *11/06*

**U.S. Cl. 156—380** **10 Claims**



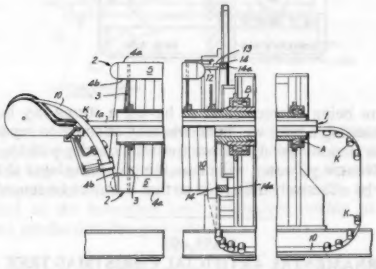

A method and apparatus for joining sheet material is disclosed in which the material to be joined is fed from supply rolls, a dry monofilament adhesive is interfed between the materials in the area thereof to be joined, the material and the interfed adhesive is then concurrently compressed and subjected to radio frequency heating energy whereby the adhesive melts and covers the sheet areas to be joined. The adhesive hardens as the material advances beyond the vicinity of the radio frequency field and is rewound on a take-up roll.

3,655,489

## WINDING AND FEEDING MANDREL FOR FORMING TUBING FROM STRIP MATERIAL

Peder Ulrik Poulsen, Lonholt Ladegard, 3480 Fredensborg, Lyngby, Denmark

Filed May 14, 1969, Ser. No. 824,576
Claims priority, application Denmark, May 14, 1968, 2231/68
Int. Cl. B65h *81/00*
U.S. Cl. 156—429 2 Claims



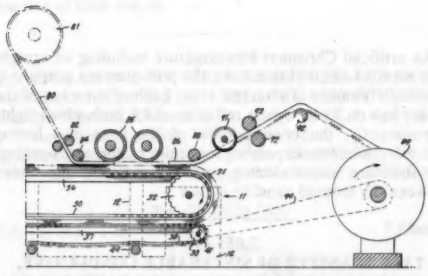
An apparatus for helically winding a strip forming the revolving surface of a winding mandrel at a pitch corresponding to the strip width, including a plurality of strip supports distributed about the winding axis of the mandrel, extending parallel thereto, spaced equally therefrom and adapted to rotate about the axis, and a stationary strip guide ring mounted concentrically with the convolutions.

3,655,490

## APPARATUS FOR PRODUCTION OF PILE CARPETING

Ralph M. Adler, New York, N.Y., assignor to Adler Process Corp., New York, N.Y.

Continuation-in-part of application Ser. No. 793,842, Jan. 24, 1969, which is a continuation-in-part of application Ser. No. 520,402, Jan. 13, 1966, now Patent No. 3,424,632. This application May 18, 1970, Ser. No. 38,384
Int. Cl. D04h *11/08*; D03d *39/00*
U.S. Cl. 156—435 10 Claims



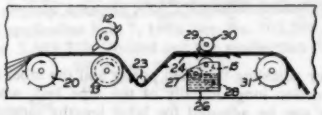
An improved process and technique for the manufacture of non-woven pile fabrics is provided by an array of loop-forming members disposed in side-by-side relationship, the array of loop-forming members being moved continuously or intermittently between a loop-forming station wherein a loop-forming member or blade descends between two adjacent loop-forming members to press yarns downwardly between said adjacent loop-forming members so as to form loops of yarn therebetween. Between the pair of loop-forming members containing the immediately previously formed loops of yarn a gauge blade is inserted to a distance not greater than and preferably less than the distance said loop-forming blade descends into said first mentioned pair of loop-forming members so as to maintain said previously formed loops of yarn in position and/or at a desired depth between the loop-forming members containing the previously formed loops of yarn as said loop-forming blade descends to form additional loops of yarn.

3,655,491

## STATIONERY BONDING APPARATUS

Leslie Alexander Dyke, Chigwell, England, assignor to Formmaster Limited, Peterborough, England

Original application Dec. 27, 1968, Ser. No. 788,673, now abandoned , which is a continuation of application Ser. No. 638,347, May 15, 1967, now abandoned. Divided and this application June 2, 1969, Ser. No. 829,244
Claims priority, application Great Britain, May 25, 1966, 23,251/66
Int. Cl. B32b *31/08, 31/18*
U.S. Cl. 156—459 3 Claims



Apparatus for producing stationery assemblies comprising means for moving a plurality of superposed webs along a path of travel, tab-cutter which cuts a plurality of superposed tabs in said webs and bends the tabs so that their free ends extend outwardly of the webs and in a leading direction along said path of travel, and a roller adhesive applicator which rotates in a direction opposite to the direction of movement of the webs. A controlled amount of quickdrying adhesive is simultaneously applied to the free ends of the tabs by the roller, with the position of the roller relative to the webs and the speed of rotation thereof being adjustable to vary the amount of adhesive applied to the free ends of the tabs and also to vary the area of the tabs to which the adhesive is applied.

3,655,492

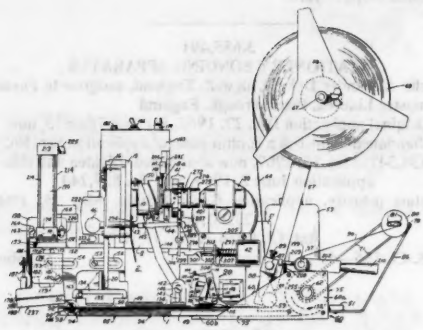
## LABEL IMPRINTING AND APPLYING MACHINE AND METHOD

Robert Burton, Philadelphia, Pa., assignor to Avery Products Corporation, San Marino, Calif.

Filed Jan. 9, 1970, Ser. No. 1,719
Int. Cl. B65c *9/18* ; B32b *31/20*
U.S. Cl. 156—541 10 Claims

A label imprinting and applying machine and method for sequentially imprinting die-cut pressure-sensitive labels carried on a backing tape drawn from a roll thereof and for synchronously applying the so imprinted labels to articles or packages of merchandise to be labeled thereby, such machine including a tape-carried label supply, a tape bed, a printer disposed above the plane of the tape bed, including a vertically reciprocable plunger and a type-bearing printer head carried thereby and an impression pad therebeneath in the plane of the tape bed, and a type inker disposed above the tape bed, an angularly adjustable label peeler immediately adjacent the impression pad of the printer, around which peeler the tape extends, a tape take-up rearwardly of the label peeler for intermittently transporting the labels through the printer and past the peeler, a pneumatic label applicator having a suction head disposed in operative juxtaposition to the peeled label, for vacuum-engaging the payed-out label and applying it to an article or package of merchandise, a label sensor disposed above the tape bed in operative juxtaposition to the labels thereon for starting and stopping the

tape take-up, and mechanical, electrical, magnetic and pneumatic means for cycling the label applicator in timed relation to the label payed-out from the peeler and electromechanical means for cycling the printer and the inker in timed relation to the label transport cycle, and means for adjusting the location of the label sensor longitudinally of the tape bed and



means for adjusting the label peeler and the label applicator in a direction longitudinally of the tape bed, whereby the machine can be adjusted for label lengths ranging from a length substantially less than either of the two adjustments to a length more than twice the length of either of the two adjustments.

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**3,655,493**

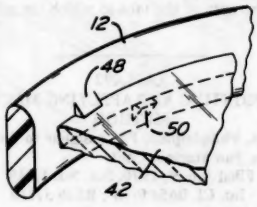
**SIMULATED LEADED STAINED GLASS**

**Jay E. Campbell, Upper Black Eddy, Pa., assignor to Fairview-Development Service, Inc., Forked River, N.J.**

**Filed Mar. 4, 1970, Ser. No. 16,512**

**Int. Cl. B44f *1/00***

**U.S. Cl. 161—5** **7 Claims**




The decorative panel includes a molded plastic frame having a plurality of closed loops of different configurations. Decorative glass panels are snap-fitted into the closed loops and have a configuration corresponding to the shape of the closed loop. The glass panels may be ribbed, dimpled, and are of different colors whereby the panel simulates leaded stained glass or Tiffany glass objects.

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**3,655,494**

**I. D. CARD LAMINAR STRUCTURES AND PROCESSES FOR MAKING SAME**

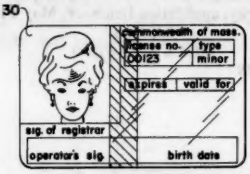
**Harold O. Buzzell, Wollaston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

**Filed May 12, 1969, Ser. No. 823,670**

**Int. Cl. B32b *27/04*; G03c *5/54*; G09b *3/02***

**U.S. Cl. 161—5** **10 Claims**

Laminar structures such as identification (ID) cards and the like including an information-bearing surface, e.g., a photograph, having affixed thereto a substantially transparent overlay including a layer at least a portion of which is light-polarizing and which is preferably dyed or stained to provide a protective security feature for said structure, the laminar




structure being characterized as having a strong dry bond, but possessing a poor wet bond whereby attempts to separate the information-bearing surface from the overlay with the aid of a solvent, e.g., water, will cause the polarizing layer to curl up and be effectively destroyed so that it cannot be reused.

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**3,655,495**

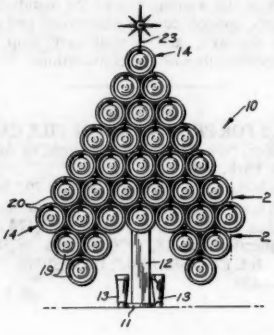
**ORNAMENTAL ARTIFICIAL CHRISTMAS TREE**

**Harvey A. Carrell, Box 14, Bonita Springs, Fla.**

**Filed Dec. 3, 1970, Ser. No. 94,874**

**Int. Cl. A47g *33/06*, *33/16***

**U.S. Cl. 161—16** **4 Claims**




An artificial Christmas tree structure including an upright post member secured to a base, the post member supporting a multiple number of attached cans. Each of the cans of the device has on its interior a reflector and a bulb which lights intermittently, the open portion of the cans also having colored ornaments depending centrally of the can opening, the structure also including smaller ornaments positioned between the secured cans.

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**3,655,496**

**TAPE TRANSFER OF SINTERABLE CONDUCTIVE, SEMICONDUCTIVE OR INSULATING PATTERNS TO ELECTRONIC COMPONENT SUBSTRATES**

**Kitty S. Ettre, Norwalk, and George Richard Castles, Stamford, both of Conn., assignors to Vitta Corporation, Wilton, Conn.**

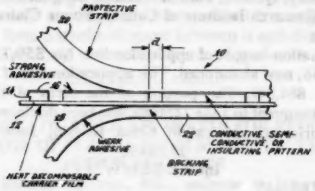
**Filed Sept. 25, 1969, Ser. No. 860,866**

**Int. Cl. B32b *7/04***

**U.S. Cl. 161—39** **6 Claims**

Conductive, semiconductive or insulating patterns such as fine line, thick film circuitry, or dot configurations are applied to electronic component substrates from a continuous transfer tape. In the transfer tape the patterns are formed

with prearranged spacing on a heat decomposable carrier film, which in turn is supported on a backing strip and covered by a protective strip. In use the protective strip is peeled off and the patterns, still adhered to the carrier film and supported by the backing strip, are adhesively secured to a group or a continuously fed series of pre-aligned substrates.




The backing strip is then peeled off, and the substrates with the applied patterns, now supported only by the heat decomposable carrier film, are placed in an oven for sintering and decomposition of the carrier film. The transfer tape and method of the invention lend themselves readily to automated, production-line procedures.

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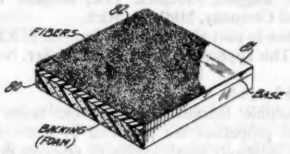
**3,655,497**
**SYNTHETIC SUEDE**

**Norman Forrest, White Plains, N.Y., assignor to Tenneco Chemicals, Inc.**

**Original application Sept. 28, 1967, Ser. No. 671,304. Divided and this application Nov. 7, 1969, Ser. No. 874,788**
**Int. Cl. B32b** *5/02*
**U.S. Cl. 161—62** **6 Claims**




A synthetic suede product, which is produced from a plastic material, such as a vinyl plastisol, has the appearance and shading characteristics of natural suede leather. The product has about 10,000 to 500,000 untapered surface fibers per square inch, the diameters of which are a small fraction of their length.

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**3,655,498**
**PLEXIFILAMENTARY STRUCTURES PREPARED FROM NON-CRYSTALLINE SYNTHETIC ORGANIC POLYMERS**

**Rudolph Woodell, Richmond, Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**Continuation-in-part of application Ser. No. 677,949, Oct. 25, 1967, now abandoned. This application Sept. 11, 1970, Ser. No. 71,582**
**Int. Cl. D02g** *3/00*
**U.S. Cl. 161—172** **7 Claims**

Plexifilamentary structures prepared by flash-spinning solutions of non-crystalline synthetic organic polymers. The structures show no long-period diffraction when subjected to small-angle X-ray analysis, and consist of a three-dimensional plexus of interconnected fibrils, which are in turn composed of uniaxially oriented film-fibril elements of the polymer.

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**3,655,499**
**POLYTETRAALLYL BENZOPHENONETETRACARBOXYLATE**

**Walter P. Barie, Jr., Shaler Township, Allegheny County, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.**

**Filed July 2, 1970, Ser. No. 52,115**
**Int. Cl. B32b** *27/04*
**U.S. Cl. 161—88** **5 Claims**

The homopolymer of tetraallyl benzophenonetetracar-boxylate is described. It is prepared as a casting resin or is used in preparing laminates.

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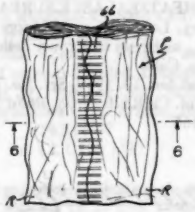
**3,655,500**
**A RESILIENT CUSHIONING DUNNAGE PRODUCT FOR USE IN PACKAGING AND PACKING**

**George R. Johnson, Chagrin Falls, Ohio, assignor to The Arpax Company, Chagrin Falls, Ohio**

**Original application Feb. 7, 1968, Ser. No. 703,588, now Patent No. 3,509,798. Divided and this application Feb. 9, 1970, Ser. No. 9,620**
**Int. Cl. B32b** *3/04*
**U.S. Cl. 161—104** **7 Claims**




A resilient cushioning dunnage product for use in packaging or packing comprising an elongated pad-like article formed of a generally loosely inwardly crumpled web of sheet-like material, such as paper sheet, with the lateral edges of the web having been rolled generally inwardly prior to the crumpling thereof, and then connected together along the generally central portion of the pad-like article lengthwise thereof.

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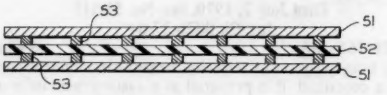
**3,655,501**
**FLEXIBLE MATERIALS**

**Guenther Horst Tesch, 13, Route de mon Repos, CH-1700 Fribourg, Switzerland**

**Filed Mar. 26, 1969, Ser. No. 810,565**
**Claims priority, application Switzerland, Mar. 26, 1968, 4565/68**
**Int. Cl. B32b** *3/10*
**U.S. Cl. 161—109** **5 Claims**

A sheet material having at least one adhesive surface or one non-slip surface, respectively, and provided with slits which allow the sheet material to expand in at least one direction.

3,655,502
HEAT INSULATING LAMINATE
Yutaka Yoshikawa, No. 2-24, Hatsudai, Shibuya-ku, Tokyo, Japan
Continuation-in-part of application Ser. No. 716,471, Mar. 27, 1968, now Patent No. 3,574,109. This application Dec. 1, 1970, Ser. No. 93,933
Claims priority, application Japan, May 9, 1967, 42/28895
Int. Cl. B32b *3/28*
U.S. Cl. 161—127 4 Claims




At least one metal foil and at least one thermoplastic resin film are bonded at a number of bonding points uniformly distributed throughout the surface to obtain heat insulating material. The heat insulating material is heated to cause shrinkage of the resin film and wrinkles of the metal foil whereby air spaces between the metal foil and the resin film are formed to obtain heat insulating layer.

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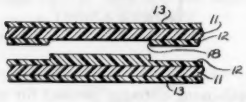
3,655,503
PACKAGE OF COMPOSITE FILM WITH PEELABLE, HEATSEALABLE SURFACES
Hugh E. Stanley, Lafayette, and George M. Tokos, Dublin, both of Calif., assignors to Crown Zellerback Corporation, San Francisco, Calif.
Filed Jan. 13, 1969, Ser. No. 790,708
Int. Cl. B32b *27/08*; B65d *17/00*
U.S. Cl. 161—165 4 Claims




A package comprised of a composite, peelable, heatsealable thermoplastic film having at least two layers, said film having a heatseal strength of less than about 1.0 pound per inch width. The low heatseal strength is achieved by an outer thermoplastic layer having a caliper of less than about 0.4 mil, the outer layer being characterized in having a tensile strength of less than about 10,000 psi and having an interlaminar steel strength of the outer layer to the molecularly different other layer of less than about 1.0 pound per inch width. Numerous combinations of thermoplastics may be employed for the outer and other layers.

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3,655,504
LAMINATED METAL PLATES
Heinz Mueller-Tamm, Ludwigshafen, and Alfred Hofmann, Roxheim, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen, Rhine Germany
Filed May 19, 1969, Ser. No. 825,929
Claims priority, application Germany, May 24, 1968, P 17 69 434.7
Int. Cl. B32b *15/08*
U.S. Cl. 161—165 1 Claim

Laminated metal plates made of (1) an outer layer of a metal, (2) an intermediate layer of a polymer, (3) an inner layer of a metal, (4) an intermediate layer of a polymer and (5) an outer layer of a metal. It is a characteristic of the invention that the polymer of layers (2) and (4) is a special terpolymer.

3,655,505
TWO-STAGE PURIFICATION OF FIBROUS CELLULOSE MATERIAL EMPLOYING GASEOUS CHLORINE DIOXIDE IN ONE STAGE AND A PEROXYGEN COMPOUND IN THE OTHER
Frederick H. Yorston, Montreal, and Norman Liebergott, Chomedey, Quebec, both of Canada, assignors to Pulp and Paper Research Institute of Canada, Pointe Claire, Quebec, Canada
Continuation-in-part of application Ser. No. 559,714, June 23, 1966, now abandoned. This application Dec. 12, 1969, Ser. No. 884,749. The portion of the term of this patent subsequent to June 22, 1988, has been disclaimed.
Claims priority, application Great Britain, June 25, 1965, 27,158/65
Int. Cl. D21c *9/14*
U.S. Cl. 162—67 5 Claims

A two stage process for bleaching an unbleached chemical cellulosic pulp in which the first stage comprises fluffing a pulp that has been adjusted in moisture content to a consistency of from about 20 to 60 percent, contacting the pulp with gaseous chlorine dioxide diluted with a non-reactive gas at a temperature of between 15° and 100° C. for a period of 20 seconds to 60 minutes, the pulp then being washed with water; and finally in the second stage adjusting the pulp moisture content to 5 percent and contacting the pulp with a peroxygen compound having a peroxygen content of from 0.025–1.5 percent by weight based on the weight of the dry pulp at a temperature up to 100° C. for a period of from ½ to 5 hours.

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3,655,506
WATER-SOLUBLE POLYALKANOLAMINE RESINS
Joseph M. Baggett, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.
Continuation-in-part of application Ser. No. 873,118, Oct. 31, 1969. This application Sept. 17, 1970, Ser. No. 73,236
Int. Cl. D21d *3/00*
U.S. Cl. 162—164 16 Claims

Water-soluble thermosetting cationic resins having advantageous properties are prepared by a two-step process wherein a relatively small excess of epichlorohydrin is first reacted with aqueous ammonia, an ammonia-polyamine mixture, or a polyamine to form an intermediate resin solution and additional epichlorohydrin is then reacted with that solution. The resin is useful as an additive to paper pulp to provide enhanced wet strength in the finished paper.

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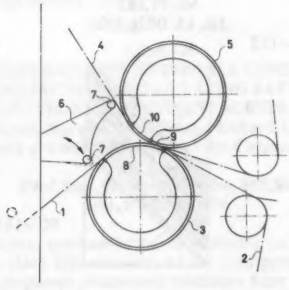
3,655,507
PRESS NIP OF A PAPER MACHINE COMPOSED OF A SUCTION ROLL AND A PRESSURE ROLL
Erik A. Nykopp, Tampere, Finland, assignor to Oy Tampella Ab, Tampere, Finland
Filed Jan. 7, 1970, Ser. No. 1,203
Claims priority, application Finland, Jan. 27, 1969, 247/69
Int. Cl. D21f *3/10*, *5/18*
U.S. Cl. 162—358 6 Claims




In a paper machine a paper web is conducted by a continuous felt or the like into the press nip between two rolls. One

roll is a suction roll and the other roll is a pressure roll having a single pressure opening located opposite to the suction opening of the suction roll such that it does not encompass the nip between the two rolls. From the pressure opening of the pressure roll a gas, preferably heated, is conducted into the space between the rolls most appropriately before the press nip. A blocking member such as a beam with a triangular cross section may be positioned on the incoming side of the rolls to form a confined space between it and the rolls to prevent escape of the warmed, pressurized gas.

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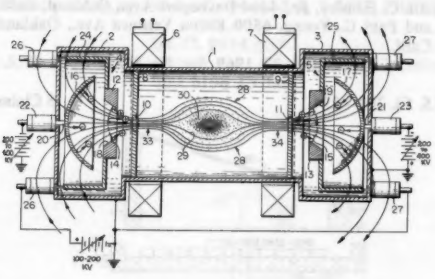
**3,655,508**

**ELECTROSTATIC FIELD APPARATUS FOR REDUCING LEAKAGE OF PLASMA FROM MAGNETIC TYPE FUSION REACTORS**

**Robert L. Hirsch, Potomac, Md., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.**

**Filed June 12, 1968, Ser. No. 736,355**
**Int. Cl. G21b** *1/00*
**U.S. Cl. 176—5** **6 Claims**



This invention relates to a fusion reactor of the magnetic mirror type having a plasma trap defined by relatively widely spaced field lines, and end regions closed substantially by said field lines. Plasma leakage from the trap occurs primarily through the end regions inasmuch as the plasma particles tend to follow the field lines instead of moving transversely thereto. Electrostatic reflectors serve to reflect particles that have escaped from the plasma trap via the end regions back thereinto along the escape paths, these electrostatic reflectors taking the form of positively and negatively charged field-forming electrodes arranged in tandem such that positively charged plasma particles will be reflected by one electrode and negatively charged particles will be reflected by the other.

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**3,655,509**

**PROCESS FOR THE SEPARATION OF VIRUS FROM NON-VIRAL PROTEINS**

**Joseph E. Fields, Ballwin, and John H. Johnson, Kirkwood, both of Mo., assignors to Monsanto Company, St. Louis, Mo.**

**Continuation-in-part of application Ser. No. 777,499, Nov. 20, 1968, which is a continuation-in-part of application Ser. No. 590,127, Aug. 19, 1966, Original application Mar. 18, 1965, Ser. No. 440,991, Continuation-in-part of application Ser. No. 248,881, Jan. 2, 1963. Divided and this application May 29, 1969, Ser. No. 829,146**
**Int. Cl. C12k** *7/00*
**U.S. Cl. 195—1.5** **31 Claims**

Viruses are selectively separated from an aqueous mixture of virus and nonviral protein by contacting the aqueous mixture with a water-insoluble polyelectrolyte polymer containing basic groups to selectively sorb the virus on the polymer and then if desired removing the polymer containing the virus from the aqueous mixture. The polyelectrolyte polymers are polycationic or polyampholytic in nature and contain imide groups selected from the group consisting of diloweralkylaminoloweralkylimide groupings and loweralkyliminodi(loweralkylimide) linkages as exemplified by crosslinked dimethylaminopropylimide derivatives of isobutylene/maleic anhydride copolymers.

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**3,655,510**

**PROCESS FOR PREPARING AMINO ACIDS FROM HYDROCARBONS**

**Katsunobu Tanaka, and Kazuo Kimura, both of Machida-shi, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan**

**Continuation of application Ser. No. 695,329, Jan. 3, 1968, now abandoned. This application June 14, 1968, Ser. No. 736,958**
**Int. Cl. C12b** *1/00*
**U.S. Cl. 195—28 R** **14 Claims**

A process for producing an amino acid, such as L-glutamic acid, L-lysine, L-ornithine, L-valine and L-homoserine, by fermentation from hydrocarbons as the main carbon source. The process is conducted by culturing a mixture of a microorganism capable of assimilating hydrocarbons and a microorganism capable of producing amino acids under aerobic conditions in an aqueous nutrient medium containing at least one hydrocarbon. Large yields of amino acids may be obtained by conducting a mixed culture of, for example, Micrococcus glutamicus with a hydrocarbon-assimilating microorganism such as Arthrobacter paraffineus or Brevibacterium ketoglutamicum.

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**3,655,511**

**RECOVERY OF MICRO-ORGANISMS CULTIVATED ON HYDROCARBONS**

**Jean Baptiste Bonavita, Epernon, France, assignor to The British Petroleum Company Limited, London, England**

**Filed May 29, 1968, Ser. No. 732,824**
**Claims priority, application Great Britain, June 27, 1967, 29,514/67**
**Int. Cl. C12b** *1/00*
**U.S. Cl. 195—28 R** **11 Claims**

Process which comprises cultivating a micro-organism which is capable of growing on at least some straight chain hydrocarbons, for example a yeast, such as a Candida tropicalis, cultivation being carried out in the presence of a hydrocarbon feedstock which consists in part of straight chain hydrocarbons in the presence of an aqueous nutrient medium and in the presence of a gas containing free oxygen and thereafter separating from the product, an aqueous phase and a product mixture, the product mixture comprising the micro-organism, unconsumed hydrocarbons and an aqueous phase, thereafter treating the product mixture with an alcohol and a solvent hydrocarbon used in either order or together each part by volume of said product mixture being treated with 0.5 to 2 parts by volume of said alcohol and with 0.5 to 2 parts by volume of said solvent hydrocarbon, the treated product mixture being thereafter subjected to phase separation with recovery of a phase comprising the solvent hydrocarbon and unconsumed hydrocarbons and with recovery of a phase mixture comprising alcohol, water and the micro-organism.

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**3,655,512**

**PROCESS FOR PRODUCING SACCHARIDES BY FERMENTATION**

**Katsunobu Tanaka, 1662 Honmachid, and Takeo Suzuki, B-744 Kosha Apt. 1857, Kogasaka, both of Machida-shi, Japan**

**Continuation of application Ser. No. 648,213, June 23, 1967, now abandoned. This application July 31, 1968, Ser. No. 748,933**
**Claims priority, application Japan, July 4, 1966, 41/43018**
**Int. Cl. C12d** *13/04*
**U.S. Cl. 195—28 R** **13 Claims**

Process for producing saccharides by fermentation which comprises culturing a microorganism capable of assimilating hydrocarbons and of producing saccharides under aerobic

conditions in an aqueous nutrient medium containing at least one hydrocarbon as the main carbon source and an additive selected from the group consisting of at least one surface active agent, at least one antibiotic and mixtures thereof. The process gives good yields of sugars such as trehalose, glucose, mannose, arabinose, fructose, ribose, their glycosides and polymerized compounds.

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3,655,513

## PURIFICATION OF PROTEASE

**Moshe Sternberg, South Bend, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.**

**Continuation-in-part of application Ser. No. 785,399, Dec. 19, 1968, now abandoned. This application Jan. 25, 1971, Ser. No. 109,567**

**Int. Cl. C07g** *7/02*

**U.S. Cl. 195—66 R** **7 Claims**

Proteases can be isolated and separated from impurities, such as colored bodies, sugars, polysaccharides and minerals, by mixing a protease solution containing impurities with a heteropoly acid to form a precipitate with the protease. The resulting precipitate is then separated from the remaining solution and dried. Useful heteropoly acids are phosphotungstic acid, arsenotungstic acid, silicotungstic acid, borotungstic acid, phosphomolybdic acid, arsenomolybdic acid, silicomolybdic acid, boromolybdic acid, phosphovanadic acid, arsenomolybdic acid, silicovanadic acid, borovanadic acid and mixtures and combinations thereof.

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3,655,514

## PROCESS FOR PURIFYING L-ASPARAGINASE

**Masao Tanaka, Machida-shi; Tsuneo Kagawa, Sunto-gun, Shizuoka-ken; Kazuo Mochizuki, Sunto-gun, Shizuoka-ken, and Masahiro Kohagura, Sunto-gun, Shizuoka-ken, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan**

**Filed June 11, 1969, Ser. No. 832,454**

**Claims priority, application Japan, June 12, 1968, 44/39934**

**Int. Cl. C07g** *7/028*

**U.S. Cl. 195—66 A** **9 Claims**

In a process for purifying an enzymatic preparation of L-asparaginase obtained from an L-asparaginase-producing micro-organism belonging to the genus Serratia wherein said micro-organism produces, together with the L-asparaginase, factors which inactivate the enzymatic activity of L-asparaginase, the improvement which comprises inhibiting the L-asparaginase inactivating factors and thus stabilizing the L-asparaginase preparation during the purification process by adding to said enzymatic preparation a heavy metal ion such as silver, cadmium, copper or zinc, and recovering purified L-asparaginase having an effective anti-tumor activity.

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3,655,515

## SAMPLE DEVICE AND METHOD

**Daniel O. Noorlander, Fresno, Calif., assignor to Milk Producers, Inc., San Antonio, Tex.**

**Filed Sept. 25, 1969, Ser. No. 861,068**

**Int. Cl. C12k** *1/04*

**U.S. Cl. 195—103.5** **22 Claims**

A container for analyzing milk and water for bacteria count formed of a flexible bag having at least one orifice for insertion of a sample and a seal for the orifice. The flexible outer bag is of sufficient size to accommodate a receptacle and cover in spaced-apart relation and allow for manipulation of the cover and receptacle into a closed relationship while within the bag and thereby avoiding undue environmental contamination.

3,655,516

## UREA ASSAY PROCESS AND COMPOSITION

**Robert J. Roon, and Bruce Levenberg, both of Ann Arbor, Mich., assignors to The Regents of the University of Michigan, Ann Arbor, Mich.**

**Filed Oct. 10, 1969, Ser. No. 865,503**

**Int. Cl. G01n** *31/14*

**U.S. Cl. 195—103.5 R** **7 Claims**

Assay of urea is provided by spectrophotometric measurement of a test solution containing the urea to be assayed together with ATP: urea amido-lyase and adenosine triphosphate as co-substrate for the enzyme, together with nicotine adenine dinucleotide, reduced; phosphoenol pyruvate; lactate dehydrogenase; pyruvate kinase; and magnesium and potassium ions. The transformation of the urea is followed quantitatively by optical absorption measurements at 340 millimicrons. The assay is unaffected by the presence of non-urea nitrogen, such as ammonia.

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3,655,517

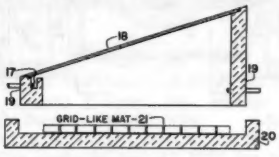
## MOLDED PLASTIC SOLAR STILL

**Justin C. Hensley, Jr., 4464 Davenport Ave., Oakland, Calif., and Paul G. Young, 6500 Buena Ventura Ave., Oakland, Calif.**

**Filed Oct. 22, 1969, Ser. No. 868,478**

**Int. Cl. B01d** *3/00*

**U.S. Cl. 202—234** **5 Claims**




A dimensionally rigid solar distillation apparatus for vaporization and condensation of water, including a slanting transparent sheet supported on generally upright wall members extending from a generally flat base wherein the wall members and base are formed from pressure molded, foamed plastic material.

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3,655,518

## RETORT SYSTEM FOR OIL SHALES AND THE LIKE

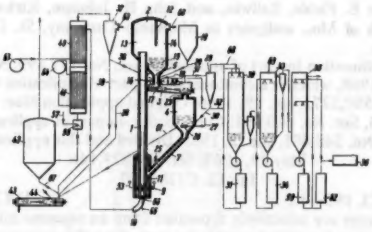
**Paul Schmalfeld, Bad Homburg; Hans Sommers, Essen, and Heinrich Janssen, Hanau, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt and Ruhrgas Aktiengesellschaft, Essen, Germany**

**Filed Nov. 19, 1969, Ser. No. 877,996**

**Claims priority, application Germany, Nov. 20, 1968, P 18 09 874.3**

**Int. Cl. C10b** *1/06, 7/10, 47/20*

**U.S. Cl. 202—108** **7 Claims**



In apparatus for retorting oil shale, oil sands and similar materials wherein finely divided solids residue is used as a heat carrier and is heated in a vertical pneumatic conveyor-burner, mixed with fresh finely divided solid feed, product

distillation vapors are removed from the mixture, and the solid distillation residue is returned to the conveyor-burner, the improvement whereby the propellant gas is introduced axially to the bottom of the conveyor-burner and the cool heat carrier is introduced thereinto from a concentric annular chamber thereabout through slits or openings in the propellant gas conduit by means of a flow of a control gas.

Other specific improvements of portions of the retorting apparatus and solids circulating system are examplified and claimed, especially a screw conveyor-mixer retorting chamber.

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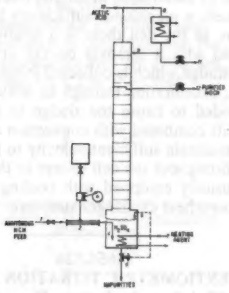
**3,655,519**

## PROCESS FOR PURIFYING LIQUID HYDROCYANIC ACID BY ACID ADDITION AND SUBSEQUENT SEPARATION

**Bernhard Scherhag, Leverkusen, and Arnold Hausweiler, Dormagen, both of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen and Erdolchemie Gesellschaft mit beschrankter Haftung, Cologne, Germany**

**Filed Jan. 31, 1969, Ser. No. 795,534**
**Claims priority, application Germany, Feb. 2, 1968, P 16 67 786.4**
**Int. Cl. B01d** *3/34*
**U.S. Cl. 203—6** **7 Claims**



Purification of hydrocyanic acid such as obtained from ammoxidation by reacting the crude product containing aliphatic and/or isocyclic unsaturated hydrocarbons and/or heterocyclic compounds with a hydrohalic acid or an oxyacid of sulfur or phosphorus, preferably in concentrated form, and thereafter separating the reaction products from the hydrocyanic acid, such as by distillation or adsorption, and recovering substantially pure hydrocyanic acid.

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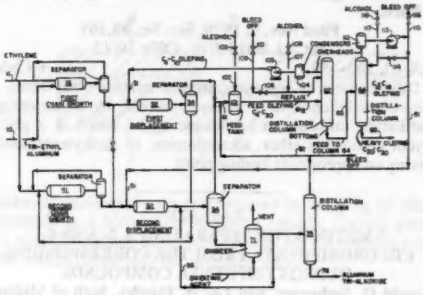
**3,655,520**

## DISTILLATION OF OLEFINS WITH ALKANOL ADDITION TO PREVENT DEGRADATION

**Alvin E. Harkins, Jr., Baton Rouge, La., assignor to Ethyl Corporation, New York, N.Y.**

**Filed Mar. 6, 1969, Ser. No. 804,967**
**Int. Cl. B01d** *3/34;* **C07f** *5/06*
**U.S. Cl. 203—6** **5 Claims**

The disclosure describes methods of improving the operation of olefin fractionation systems wherein residual materials contained in the olefins catalyze side reactions of the olefins during the distillation operations or subsequent thereto. The improvement is obtained by the addition of alcohols of



selected molecular weight at several critical locations in the system, one location in particular.

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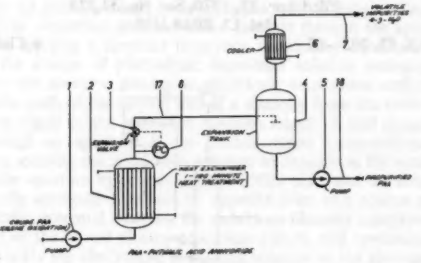
**3,655,521**

## PRETREATMENT PROCESS FOR THE DISTILLATION OF CRUDE PHTHALIC ANHYDRIDE

**Hubert Gehrken, Weiden; Gerd Helms, Junkersdorf; Gerhard Keunecke, Geyen, and Herbert Krimphove, Cologne-Mungersdorf, all of Germany, assignors to Chemiebau Dr. A. Zieren GmbH and Co. KG, Cologne, Germany**

**Filed Mar. 27, 1969, Ser. No. 842,417**
**Claims priority, application Germany, Mar. 27, 1968, P 17 68 059.0**
**Int. Cl. B01d** *3/06;* **C07c** *63/18*
**U.S. Cl. 203—28** **9 Claims**



Crude liquid phthalic anhydride produced from the catalytic air oxidation of o-xylene, and containing minor quantities of acids such as phthalic acid and in addition, compounds more volatile than phthalic anhydride, is subjected to a special pretreatment to remove the acids and the more volatile materials, said pretreatment having a relatively short residence time and comprising heating said crude liquid phthalic anhydride under a first pressure in the liquid phase to a temperature of about 235°–330° C for a sufficient time to convert said phthalic acid to phthalic anhydride and then expanding said heated liquid to a lower pressure than said first pressure to volatilize gases containing at least a portion of said more volatile substances and simultaneously cool resultant liquid to a temperature lower than the boiling point of phthalic anhydride at said lower pressure.

## 3,655,522
## PURIFICATION OF PHENYLPHENOL FROM DIBENZOFURAN BY AZEOTROPIC DISTILLATION

**Harold O. Seeburger, and Lee H. Horsley, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.**

**Filed Nov. 9, 1970, Ser. No. 88,101**
**Int. Cl. B01d** *3/36;* **C07c** *39/12*
**U.S. Cl. 203—59** **6 Claims**

Dibenzofuran is separated from a mixture with ortho- or para-phenylphenol, or a mixture thereof, by an azeotropic distillation utilizing an azeotropic agent which is a glycol, glycol monoalkyl ether, alkanolamine, or dialkylenetriamine having an appropriate boiling point.

## 3,655,523
## METHOD FOR SEPARATING A 2- AND 4-CHLOROBIPHENYL FROM THE CORRESPONDING HYDROXYBIPHENYL COMPOUNDS

**Harold O. Seeburger, and Lee H. Horsley, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.**

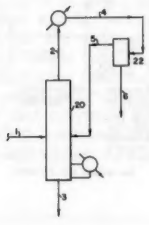
**Filed Oct. 15, 1969, Ser. No. 866,734**
**Int. Cl. B01d** *3/36;* **C07c** *25/18*
**U.S. Cl. 203—59** **6 Claims**

2-Chlorobiphenyl, 4-chlorobiphenyl or mixtures thereof may be separated from a mixture with the corresponding hydroxybiphenyl compound by adding to the mixture of such compounds an azeotropic agent which is a glycol, glycol monoalkyl or phenyl ether, glycerol, glycerol alkyl ether, alkanolamine or dialkylenetriamine having a boiling point within about 45° C. of the halobiphenyl compound at atmospheric pressure, and then fractionally distilling the mixture thus formed at a pressure of up to about 200 mm. Hg. absolute.

## 3,655,524
## GLYCIDOL ISOLATION BY AZEOTROPIC DISTILLATION WITH A LOWER-BOILING ENTRAINER

**Sol Abraham Mednick, Baltimore, Md., assignor to FMC Corporation, New York, N.Y.**

**Filed Apr. 27, 1970, Ser. No. 32,273**
**Int. Cl. B01d** *3/36*
**U.S. Cl. 203—67** **6 Claims**

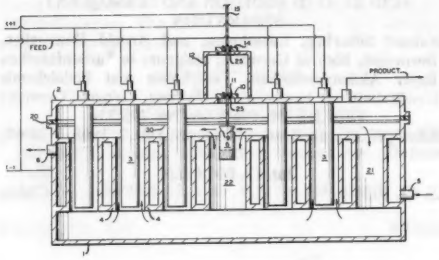


This specification discloses a process for isolating glycidol from a solution in a solvent which boils above 126° C. and which forms a low-boiling azeotrope with glycidol that is homogeneous when condensed and cooled to room temperature. The glycidol separation is affected by adding to this solution, tetrachloroethylene or a liquid aliphatic, cycloaliphatic or chlorinated aliphatic hydrocarbon; these additives form even lower boiling azeotropes with glycidol, and the lower boiling azeotrope can be distilled away from the original solvent. The noted additives have the property that their lower boiling azeotropes with glycidol, upon condensation and cooling, separate at 20° to 40° C. and even above, into two phases; one phase is rich in glycidol and the second phase contains relatively little glycidol. The two phases can be easily separated, for example, by decantation. If glycidol of higher purity than that of the glycidol-rich phase is desired, it may be obtained by distillation of that phase.

## 3,655,525
## SLUDGE REMOVAL FROM ELECTROCHEMICAL CELL

**William V. Childs, Bartlesville, Okla., assignor to Phillips Petroleum Company**

**Filed Feb. 25, 1970, Ser. No. 14,063**
**Int. Cl. B01k** *3/00*
**U.S. Cl. 204—1 R** **7 Claims**

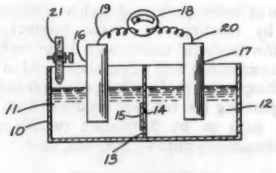



Circulation of electrolyte in an electrochemical cell, e.g., fluorination cell, is maintained sufficiently high to keep solids in suspension. In the cell there is a relatively small settling zone provided with a removal bucket or other means for disposing of sludge which is collected in said zone. A cyclone arrangement, deceleration through an orifice or other means can be provided to cause the sludge to enter the bucket. Natural gas-lift combined with convection circulation can be relied on to maintain sufficient velocity to keep the sludge in suspension throughout the cell except in the settling section. The cell is usually equipped with cooling means such as a tubes-and-sheets heat exchanger structure.

## 3,655,526
## POTENTIOMETRIC TITRATION PROCESS

**Gary Dale Christian, Lexington, Ky., assignor to Miles Laboratories, Inc., Elkhart, Ind.**

**Filed Nov. 20, 1969, Ser. No. 878,312**
**Int. Cl. G01n** *27/40, 27/46*
**U.S. Cl. 204—1 T** **7 Claims**

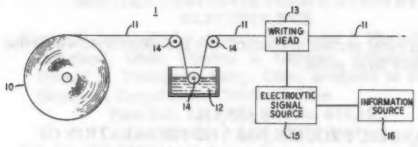


Potentiometric titration of a wide variety of reagents in solution can be conducted using an ion selective sensing device including a standard reference electrode, a reference electrolyte and a semipermeable polymeric membrane which separates the reference electrolyte from the solution containing the ion being titrated. The semipermeable polymeric membrane contains an ester of phthalic or isophthalic acid which serves to discriminate between the ion being titrated and other ions in the medium.

## 3,655,527
## ELECTROLYTIC PRINTING USING POLYVINYL ALCOHOL

**Robert Kyran Curran, Stirling; Robert Eugene Kerwin, Westfield, and Theodore Arthur Shankoff, Mendham, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Sept. 14, 1970, Ser. No. 71,718**
**Int. Cl. B21h** *1/20*
**U.S. Cl. 204—2** **5 Claims**




Hard copy prints are produced by an electrolytic scanning process. Free iodine is generated in the printing sheet at the writing electrode and reacts with colorless polyvinyl alcohol (PVA) in the 5,000 to 500,000 molecular weight range to produce optically dense colored spots. The color depends upon the molecular weights of the vinyl alcohol polymers present.

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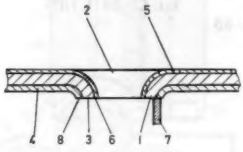
## 3,655,528
## METHOD OF MAKING A CUTTING FOIL OR PLATE FOR SHAVERS

**Bodo Futterer, Schonbuhlring 37, Switzerland**

**Original application Sept. 16, 1968, Ser. No. 760,011. Divided and this application May 18, 1970, Ser. No. 48,742**
**Int. Cl. C23b** *7/00, 5/48*
**U.S. Cl. 204—11** **2 Claims**



A process for producing a cutting foil for dry shavers in which a bearing metal is provided on the underside thereof to minimize wear and friction between the foil and a cutter blade.

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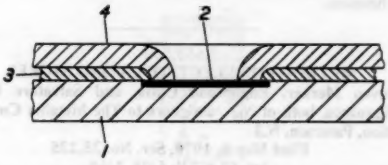
## 3,655,529
## ELECTRODEPOSITION PROCESS FOR PRODUCING PERFORATED FOILS WITH RAISED PORTIONS AT THE EDGES OF THE HOLES

**Bodo Futterer, Schonbuhlring 37 CH-6000, Luzern, Switzerland**

**Original application July 6, 1967, Ser. No. 651,548, now abandoned. Divided and this application July 7, 1970, Ser. No. 52,806**
**Int. Cl. C23b** *7/00;* **B01k** *1/00*
**U.S. Cl. 204—11** **2 Claims**

A repairable master negative and a process for producing a master negative suitable for the production of a number of perforated foils and for regenerating such a master negative when it is worn, comprising applying insulating material to one surface of a metallic base plate that is stable in a bath of an alkali at selected areas thereof which conform with the perforations in the foils to be produced, applying a coating of a metal which is erodable in a bath of an alkali which is built up on the metallic base plate after the insulating areas have been applied to it, and passivating the metallic coating. When the master negative is worn due to the production of a



number of perforated foils, it is repaired by stripping off electrolytically in a bath of an alkali the metallic coating and a new metallic coating is electrodeposited on the metallic base plate without disturbing the insulated areas.

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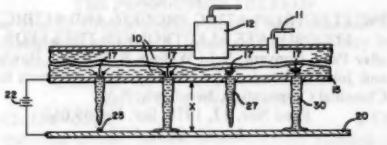
## 3,655,530
## FABRICATION OF ORIFICES

**Richard P. Taylor, Chillicothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio**

**Filed June 15, 1970, Ser. No. 46,395**
**Int. Cl. C23b** *5/56, 5/48;* **B01k** *3/00*
**U.S. Cl. 204—26** **6 Claims**



A method and apparatus for fabricating an aperture of predetermined cross-sectional area in an orifice plate for use in a non-contact printer, includes the steps of fabricating in the orifice plate an aperture of cross-sectional area no less than the predetermined cross-sectional area, flowing an electrolytic deposition solution under pressure through the aperture, applying a constant frequency stimulating disturbance to the stream of electrolytic deposition solution emerging from the aperture, placing an electrically conductive surface in the path of the stream and at a distance from the orifice plate equal to the unbroken filament length of said stream through an aperture of the predetermined cross-sectional area, causing the deposition solution to deposit on the walls of the aperture by connecting the orifice plate and the electrically conductive surface to opposite sides of a source of electric potential whereby the unbroken filament comprises part of the closed electro-deposition circuit, and continuing to supply the electrolytic deposition solution to the aperture until the aperture attains the predetermined cross-sectional area thereby producing filament breakup ahead of the electrically conductive surface and automatically opening the electro-deposition circuit.

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## 3,655,531
## METALIZING SUBSTRATES

**Edward J. Quinn, Tonawanda, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.**

**Continuation-in-part of application Ser. No. 747,495, July 25, 1968, now abandoned. This application June 6, 1969, Ser. No. 831,224**
**Int. Cl. C23b** *5/60*
**U.S. Cl. 204—30** **13 Claims**

Substrates, particularly thermoplastic resins and polymers, are plated with metals by pre-treatment of the substrate with phosphorus in an organic solvent to deposit phosphorus at

the surface, followed by contacting the treated surface wit a metal salt or complex thereof, to form a metal-phosphorus compound. Thereafter the substrate is subjected to an aqueous hypophosphite solution. The resulting treated surface is conductive and can be readily electroplated by conventional techniques.

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**3,655,532**

## METHOD FOR ELECTROPLATING NICKEL

**Reuven Merker, Englewood Cliffs, and Salvatore Lucca, Paramus, both of N.J., assignors to The Metalux Corporation, Paterson, N.J.**

**Filed May 6, 1970, Ser. No. 35,225**
**Int. Cl. C23b** *5/08, 5/46*
**U.S. Cl. 204—49** **5 Claims**

Method for electroplating nickel to obtain a bright deposit by adding to a conventional nickel acidic bath solution effective amounts of a brightening agent having the general formula

$$RSO_2NY(CH_2CH_2O)_nZ$$

where R is a phenyl, alkyl or alkenyl radical with one to 14 carbon atoms, Y is hydrogen or an alkyl radical with one to six carbon atoms, *n* is a numeral from one to six, and Z is a metal imparting water solubility to the brightening agent.

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**3,655,533**

## ZINC ELECTROPLATING PROCESS AND ACIDIC ZINC FLUOBORATE ELECTROLYTE THEREFOR

**Walter Page, Convent, N.J.; William R. Schevey, Hawley, Pa., and John E. Vander Mey, Stirling, N.J., assignors to Allied Chemical Corporation, New York, N.Y.**

**Filed Nov. 12, 1970, Ser. No. 89,068**
**Int. Cl. C23b** *5/12*
**U.S. Cl. 204—55 R** **21 Claims**

An acidic zinc electroplating bath comprising zinc fluoborate dissolved in an aqueous liquid containing as an iron- and metal oxide-deposition inhibitor a small effective amount of a mixture of a 4-hydroxy-, 4-alkyl- or aryl-, 5-acyl- or aroyl-piperidine and thiourea or N-substituted derivative thereof. The invention also includes an improved process for zinc-electroplating ferrous metals from such bath.

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**3,655,534**

## ALKALINE BRIGHT ZINC ELECTROPLATING

**Marcis M. Kampe, Cleveland Heights, Ohio, assignor to Enthone, Incorporated, West Haven, Conn.**

**Filed Feb. 24, 1970, Ser. No. 13,791**
**Int. Cl. C23b** *5/12, 5/46*
**U.S. Cl. 204—55** **26 Claims**

Bright zinc is electrodeposited from alkaline zinc electrodepositing baths comprising an alkaline solution containing a source of zinc ions and an effective amount, as a brightening agent, of a bath-soluble reaction product obtained by the reaction of a nitrogen-containing heterocyclic compound with an acyclic amine having at least two functional groups separated by at least one different group, formaldehyde, and an epihalohydrin or a glycerol chlorohydrin.

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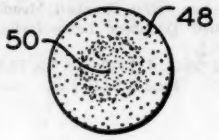
**3,655,535**

## MULTI-POROSITY ELECTRODE FOR ELECTROCHEMICAL CONVERSION

**Forrest N. Ruehlen, and Homer M. Fox, both of Bartlesville, Okla., assignors to Phillips Petroleum Company**

**Continuation of application Ser. No. 739,505, June 24, 1968, now abandoned. This application Sept. 24, 1970, Ser. No. 75,292**
**Int. Cl. B01k** *3/00*
**U.S. Cl. 204—59** **11 Claims**

In an electrochemical process, the reaction takes place within the confines of a porous electrode element having a core section which is relatively impervious to the electrolyte




and an outer section in contact with the electrolyte which has relatively large pores.

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**3,655,536**

## ANODIC PROCESS FOR THE PREPARATION OF TETRAALKYL LEAD COMPOUNDS

**William H. Harwood, Lawton, Okla., assignor to Continental Oil Company, Ponca City, Okla.**

**Filed Nov. 6, 1969, Ser. No. 874,688**
**Int. Cl. B01k** *1/00*
**U.S. Cl. 204—59** **8 Claims**

An electrochemical process for the anodic alkylation of lead using $KAlR_2X_2$ and RX, where R is selected from the group consisting of ethyl, propyl, isopropyl, butyl and isobutyl and X is selected from the group consisting of bromine, chlorine and iodine, with a lead anode and an inert conductor as the cathode.

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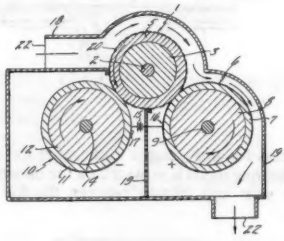
**3,655,537**

## PROCESS FOR SEPARATING GASES

**Cornelius R. Russell, West Hartford, and Sid Russell, Suffield, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.**

**Filed Nov. 18, 1970, Ser. No. 90,527**
**Int. Cl. B01k** *1/00*
**U.S. Cl. 204—60** **8 Claims**



A process for removing a gaseous constituent from a gaseous mixture involving contacting a layer of electrolyte with the gaseous mixture and then electrolytically decomposing the gaseous constituent into its component parts.

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**3,655,538**

## PROCESS FOR ELECTROWINNING ZINC FROM SULFIDE CONCENTRATES

**Howard C. Renken, and Theodoor W. Zegers, both of Columbus, Ohio, assignors to Texas Gulf Sulphur Company, New York, N.Y.**

**Filed May 19, 1969, Ser. No. 825,578**
**Int. Cl. C22d** *1/22;* **C01b** *17/06*
**U.S. Cl. 204—114** **8 Claims**

This disclosure is directed to leaching zinc sulfide concentrates to facilitate the production of zinc and sulphur. solution. To provide for increased recovery the copper sulfate leach

The zinc sulfide is leached with a copper sulfate solution, preferably under oxidizing conditions, to produce a copper sulfide and a zinc sulfate solution. The elemental sulphur can be obtained from the copper sulfide by a subsequent oxidizing leach and the zinc metal can be obtained by electrolyzing the zinc sulfate leach may be accomplished in a staging operation to establish an excess of zinc sulfide concentrate in the initial leach step.

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**3,655,539**

**SOLUBLE CHROMATE PURIFICATION BY ELECTROLYSIS**

**George F. Schoendorfer, Atlanta, Ill.; Roger J. Morschhauser, Cleveland, Ohio; Thomas S. Gardner, Painesville, and Donald L. Thompson, Perry, Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio**

**Filed Feb. 15, 1967, Ser. No. 616,165**

**Int. Cl. C01b** *7/06;* **C01d** *7/34*

**U.S. Cl. 204—128** **8 Claims**

The halide content of chromate solutions is reduced by subjecting the impure solutions to electrolysis in a diaphragmless electrolytic cell whereby, at least a portion of said halide is converted to gaseous halogen which may then be readily separated from the aqueous chromate solution.

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**3,655,540**

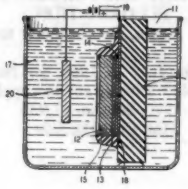
**METHOD OF MAKING SEMICONDUCTOR DEVICE COMPONENTS**

**John Calhoun Irvin, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed June 22, 1970, Ser. No. 48,315**

**Int. Cl. B23p** *1/00*

**U.S. Cl. 204—143 GE** **6 Claims**



Extremely thin semiconductor wafers are formed by growing an N-conductivity epitaxial layer on an $N^+$-type substrate. A Schottky barrier contact is formed on the epitaxial layer and the assembly is immersed in an appropriate fluid for electrolytic etching. Because of differential etch rates as a function of conductivity, and with an appropriate contact voltage, the substrate is selectively dissolved, leaving only the thin epitaxial layer adhered to the contact. The contact is then removed, leaving the epitaxial layer as an independent ultrathin wafer.

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**3,655,541**

**CONTINUOUS ELECTROPHORESIS CELL WITH LATERAL PH GRADIENT**

**Allen Strickler, Fullerton, Calif., assignor to Beckman Instruments, Inc.**

**Filed Jan. 22, 1970, Ser. No. 5,021**

**Int. Cl. B01k** *5/00*

**U.S. Cl. 204—180 R** **17 Claims**

In a continuous electrophoresis cell, the present invention comprises means for establishing a lateral pH gradient in the electrolyte curtain whereby electrophoresis may be conducted at different lateral positions within the curtain, and in which, if desired, components may equilibrate at different lateral positions according to their isoelectric points. According to a first embodiment of the present invention, two curtain solutions of different pH are introduced continuously at laterally spaced positions. A gradient smoothing device is provided for partially mixing the two curtain solutions to such an extent that the plot of pH from one side of the curtain to the other is a continuous function, preferably approximately linear. According to a second embodiment of the invention, a hybrid arrangement permits either a two-curtain solution feed for pH effect exploration or a single curtain solution feed for conventional operation.

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**3,655,542**

**MODIFIED CELLULAR PARTICLE AND PROCESS FOR THE PRODUCTION THEREOF**

**Isamu Tamai; Minoru Oyama; Atsushi Osakada, and Yasuo Shinohara, all of Otsu-shi, Japan, assignors to Toray Industries, Inc., Tokyo, Japan**

**Filed Mar. 5, 1969, Ser. No. 804,435**

**Int. Cl. C08f** *47/10, 29/04*

**U.S. Cl. 204—159.2** **2 Claims**

A modified cellular particle is provided for molding cellular articles and comprises a partially foamed thermoplastic resin containing excess foaming agent which decomposes upon heating to generate a gas. The cellular particle has a mean specific gravity of 95 – 10 percent of the specific gravity of the resin composition, the polymer is cross-linked to a gel content of 20 – 90 percent and the particle has substantially no surface pores. The particles have a mean volume of 0.01 – 2 cc.

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**3,655,543**

**METHOD OF COATING THE SURFACES OF ELECTRICALLY CONDUCTING AND SEMICONDUCTING MATERIALS WITH AN ELECTRICALLY INSULATING POLYMERIC FILM BY MEANS OF ELECTROLYSIS**

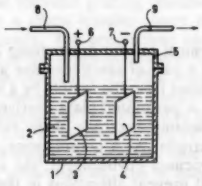
**Rinse Dijkstra, and Cornelis Bernardus Van Diepen, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed July 18, 1969, Ser. No. 842,878**

**Claims priority, application Netherlands, July 19, 1968, 6810338**

**Int. Cl. B01k** *5/02;* **C23b** *13/00*

**U.S. Cl. 204—181** **8 Claims**



Method of forming a polymeric phenolic coating on an object used as an anode in the electrolytic polymerization of an anhydrous electrolyte containing a phenol.

3,655,544

## REFRACTORY METAL/REFRACTORY METAL NITRIDE RESISTOR FILMS

John R. Rairden, III, Niskayuna, N.Y., assignor to General Electric Company

Filed Mar. 2, 1970, Ser. No. 15,473
Int. Cl. C23c *15/00*
U.S. Cl. 204—192 5 Claims

Low temperature coefficient of resistance, high resistivity films of a refractory metal/refractory metal nitride are formed by sputtering a tungsten or molybdenum cathode in a chamber containing a mixture of an inert gas and nitrogen wherein nitrogen forms between 0.3 and 3.0 percent of the sputtering chamber pressure. The deposited films characteristically are a mixture of the sputtered metal and at least 5 percent by volume of the metal nitride with films having especially superior electrical characteristics containing the metal nitride in concentrations between approximately 40 and 60 percent by volume of the resistor film.

3,655,545

## POST HEATING OF SPUTTERED METAL OXIDE FILMS

Frank H. Gillery, Allison Park, and Jean P. Pressau, Evans City, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of application Ser. No. 709,135, Feb. 28, 1968, now abandoned. This application July 2, 1970, Ser. No. 56,117
Int. Cl. C23c *15/00*
U.S. Cl. 204—192 10 Claims

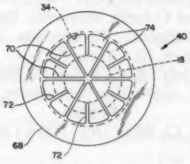
This invention relates to a novel method of producing electroconductive metal oxide films by cathodic sputtering. It especially pertains to a method of increasing the electroconductivity of sputtered metal oxide films by mildly reducing said films. The reduction step follows sputtering and generally involves heating the metal oxide film in a non-oxidizing or reducing atmosphere for a sufficient period of time to reduce the oxygen content of said film by a minor amount but without substantially reducing the oxide film to metallic form.

3,655,546

## ELECTROCHEMICAL CELL

Frank A. Marovich, Hacienda Heights, and Ray I. Wilson, La Habra, both of Calif., assignors to Beckman Instruments, Inc.

Filed Apr. 22, 1969, Ser. No. 818,214
Int. Cl. G01n *27/46*
U.S. Cl. 204—195 5 Claims



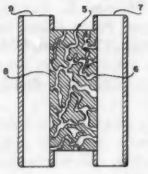

An electrochemical cell for determining a constituent in a sample in which a pair of electrodes are joined by an electrolyte and separated from the sample by a selectively permeable membrane. A perforated plate overlying the membrane adjacent to the sensing electrode of the cell is spring biased toward said electrode. As a consequence, when the cell is subjected to a vacuum environment, the spring biased perforated plate will prevent alterations in the thickness of the electrolyte film space between the membrane and sensing electrode or bursting of the membrane due to the relatively higher pressure within the cell. The cell is stable in a vacuum environment and has fast response when utilized at low sample gas pressure.

3,655,547

## ELECTROCHEMICAL CELL HAVING A BIPOLAR ELECTRODE

Ernest H. Lyons, Jr., Menlo Park, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Aug. 27, 1969, Ser. No. 853,469
Int. Cl. B01k *3/04*; C22d *1/02*
U.S. Cl. 204—248 1 Claim



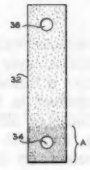

An electrochemical cell is disclosed which comprises a bipolar electrode having two spaced surfaces adapted for exposure to an oxidizing agent and a reducing agent, respectively. The two electrode surfaces are interconnected by ion and electron conveyance means. The electrochemical cell may be used in recovering sulfur from flue gases in the form of sulfuric acid of commercial purity and concentration.

3,655,548

## TREATED POROUS ANODE FOR ELECTROCHEMICAL FLUORINATION

William V. Childs, Austin, Tex., assignor to Phillips Petroleum Company

Original application June 24, 1968, Ser. No. 739,509, now Patent No. 3,558,449. Divided and this application July 24, 1970, Ser. No. 57,938
Int. Cl. B01k *3/04*
U.S. Cl. 204—284 12 Claims




In an electrochemical fluorination process wherein the reaction takes place within the confines of a porous electrode element, the lower portion of this element is impregnated with a surfactant having a fluorocarbon radical having a terminal $-CF_3$ group.

3,655,549

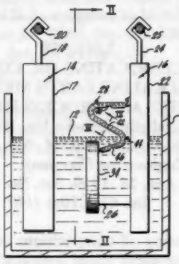
## FIXTURES FOR ELECTROCHEMICAL PROCESSES

Robert G. Wild, Fraser, Mich., assignor to Michael Ladney, Jr., Grosse Pointe Shores, Mich.

Filed June 3, 1970, Ser. No. 43,149
Int. Cl. C23b *5/70*; B01r *3/04*
U.S. Cl. 204—297 R 4 Claims

A rack for use in electroplating having current-carrying metal workpiece mounting brackets which are substantially covered with insulation but which have selected areas not

covered with insulation so as to expose the bare metal of the brackets to the surrounding plating solution or air in order to



provide efficient transfer of heat from the bracket to the surrounding medium.

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**3,655,550**

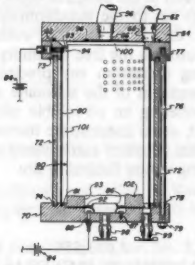
**ELECTROSTATIC PIGMENT FILTER**

**Terence J. Davies, Santa Barbara, Calif., assignor to Xerox Corporation, Rochester, N.Y.**

**Filed Mar. 12, 1969, Ser. No. 806,637**

**Int. Cl. B01d *13/02***

**U.S. Cl. 204—302** **13 Claims**



Method and apparatus for removing solid particles from a suspension by moving the suspension through a filter in which an electrostatic charge is generated. In one embodiment the electrically sensitive solid particles are attracted to and held by a dielectric porous filter material while an electrically insulating fluid carrier continues through the filter housing where it exits free from solid particle contamination.

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**3,655,551**

**HYDROCRACKING-HYDROGENATION PROCESS**

**Robert H. Kass, Fullerton; Paul F. Helfrey, Whittier, and Nicholas L. Kay, Fullerton, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.**

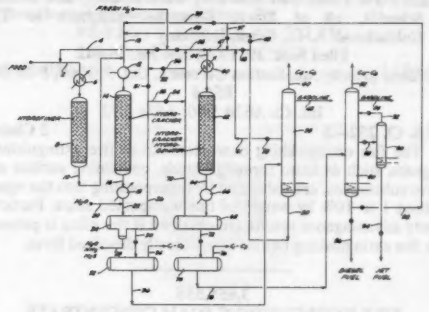
**Continuation-in-part of application Ser. No. 792,619, Jan. 21, 1969, now abandoned , which is a continuation-in-part of application Ser. No. 592,482, Nov. 7, 1966, now abandoned.**

**This application June 1, 1970, Ser. No. 42,053**

**Int. Cl. C10g *13/02*; C07c *5/02*; B01j *11/40***

**U.S. Cl. 208—59** **25 Claims**

A cyclic hydrocracking-hydrogenating process comprising a gasoline-producing cycle, passing a mineral oil feedstock through a first and second catalyst contact zone to effect a substantial synthesis of gasoline; and in a middle distillate producing cycle, passing the feedstock through the first zone to effect a substantial synthesis to middle distillate and passing unconverted oil and middle distillate from the first contacting zone in the substantial absence of hydrogen sulfide through the second contacting zone to substantially hydrogenate without substantially hydrocracking and unconverted oil and middle distillate; the catalyst in the second contacting zone comprising a Group VIII noble metal hydrogenation component support on an active zeolitic cracking base.



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**3,655,552**

**METHOD FOR REMOVING PHOSPHATE FROM WASTE WATER**

**Howard George Flock, Jr., Bethel Park, and Emerson George Rausch, Corapolis, both of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.**

**Filed Feb. 16, 1971, Ser. No. 115,850**

**Int. Cl. C02b *1/20***

**U.S. Cl. 210—47** **6 Claims**

Phosphate is removed from municipal and industrial waste water by treating the water with a synergistic admixture of a water-soluble high molecular weight nonionic polymer, preferably polyacrylamide, and a water-soluble salt containing ferric ions, preferably ferric chloride.

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**3,655,553**

**PROCESS FOR GRAFTING POLYMERIC VINYL AND VINYLIDENE CHLORIDE SIDE-CHAINS TO POLYOLS AND FLUID DISPERSION COMPOSITIONS**

**Raymond C. De Wald, Douglassville, Pa., assignor to The Firestone Tire & Rubber Company, Akron, Ohio**

**Filed Mar. 12, 1970, Ser. No. 19,105**

**Int. Cl. C08f *29/24***

**U.S. Cl. 252—1** **28 Claims**

This invention comprises a process for grafting polymeric sidechains of vinyl and vinylidene chloride to triols such as polyethylenoxy or polypropylenoxy triols and the product produced thereby. It has been found that by the polymerization of specific mixtures of vinyl chloride and vinylidene chloride in the presence of such triols, polymeric sidechains are grafted to the polyols in such a manner that the grafted products have much lower viscosities than are obtained when either the vinyl chloride or the vinylidene chloride is used alone in otherwise identical grafting operations. The mixture can also contain a chain transfer agent to aid further in reducing the viscosity. The proportions used in the monomer mixtures are in the range of 15–88% by weight of vinyl chloride, 12–85%, preferably 15–85% vinylidene chloride, and 0–5 parts by weight of a chain transfer agent. The proportion of monomer in the polyol mixture is advantageously in the range of 21–45%, preferably 25–45% by weight based on the combined weight of monomer and polyol, and the resultant product advantageously has at least 15% by weight chlorine. The resultant chlorinated polyol is particularly useful in the preparation of polyurethanes having fire retardant properties, by the reaction of the polyols with diisocyanates such as toluene diisocyanate.

3,655,554

## FIRE EXTINGUISHING FOAMS CONTAINING FINELY DISPERSED SILICA

Hans-Ferdi Fink; Gotz Koerner; Gerd Rossmy, and Gunter Schmidt, all of Essen, Germany, assignors to Th. Goldschmidt A.-G., Essen, Germany

Filed Sept. 29, 1970, Ser. No. 76,602
Claims priority, application Germany, Oct. 9, 1969, P 19 50 856.6
Int. Cl. A62d *1/00;* A62c *1/12*
U.S. Cl. 252—3 5 Claims

The fire extinguishing characteristics of fire extinguishing agents, such as foam forming liquids, containing surface active substances, are enhanced by incorporating into the agent about 1 to 10% by weight of finely dispersed silica. Particularly advantageous results are obtained if the silica is present in fire extinguishing liquids in colloidally dissolved form.

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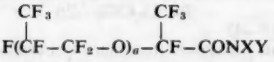
3,655,555

## FIRE EXTINGUISHING FOAM CONCENTRATE COMPRISING AN ORGANIC FLUORINE COMPOUND AND A SOLUBILIZING AGENT

Gerd Rossmy, and Gotz Koerner, both of Essen, Germany, assignors to Th. Goldschmidt A.G., Essen, Germany

Filed Oct. 31, 1969, Ser. No. 873,130
Claims priority, application Germany, Dec. 4, 1968, P 18 12 531.0
Int. Cl. A62d *1/00*
U.S. Cl. 252—3 7 Claims

A water containing fire extinguishing foam concentrate comprises an active ingredient about 1% to 10% by weight of a compound of the general formula



wherein

$a$ is a number of between one and three inclusive, X is hydrogen or Y and Y is a hydrophilating group such as polethyleneglykol or an aminoxyd or ammoniumsalt containing group.

The concentrate may also contain solubilizing agents.

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3,655,556

## NITROGEN-, PHOSPHORUS- AND SULFUR-CONTAINING LUBRICANT ADDITIVES

John Wight Allen, Euclid, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed Aug. 14, 1970, Ser. No. 63,946
Int. Cl. C10m *1/48*
U.S. Cl. 252—32.7 E 19 Claims

Compositions useful as antioxidants, corrosion inhibitors and extreme pressure agents in lubricants are prepared from hydrazine or a substituted hydrazine, carbon disulfide, and the product obtained by reacting a hydroxy-substituted phosphorothioic acid triester with an inorganic phosphorus acid, oxide or halide and neutralizing a substantial portion of the acidic intermediate thus obtained with an amine.

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3,655,557

## DETERGENT ADDITIVES

John F. Marsh, Oxford, and Joseph M. Swietlik, Reading, both of England, assignors to Esso Research and Engineering Company

Filed Sept. 4, 1969, Ser. No. 855,378
Claims priority, application Great Britain, Sept. 11, 1968, 43,253/68
Int. Cl. C10m *1/46*
U.S. Cl. 252—32.7 HC 14 Claims

Detergent additives for lubricating oils which are highly basic are prepared by reacting a carboxylic acid (e.g. formic acid) with a metal alcoholate in the presence of a surfactant (e.g. a sulphonate) dissolved in an oil.

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3,655,558

## MINERAL LUBRICATING OIL COMPOSITIONS CONTAINING ALKALINE EARTH METAL SULFONATES AND PHOSPHITES AND PROCESS PRODUCING SAME

Jerome Geyer, Elizabeth; Shih-En Hu, Westfield, and Max L. Robbins, South Orange, all of N.J., assignors to Esso Research and Engineering Company

Filed Apr. 24, 1969, Ser. No. 819,108
Int. Cl. C10m *1/40*
U.S. Cl. 252—33 23 Claims

Mineral lubricating oil compositions containing oil-soluble overbased alkaline earth metal hydrocarbon sulfonates, employed in internal combustion engines, are improved as to their antirust, sludge inhibiting and/or antiwear properties by incorporating into such compositions, in colloidal form, small amounts, for example 0.01 to 10.0 wt. percent, of the total oil composition, of in situ formed oil-insoluble inorganic alkaline earth metal phosphorus salts derived from the lower oxy or thio acids of phosphorus or from the corresponding oxides or sulfides of phosphorus which, upon hydrolysis, yield the lower oxy or thio acids of phosphorus. The preferred process of preparing such compositions involves the treatment of the neutral or overbased alkaline earth metal sulfonates, either of petroleum origin or of synthetic long chain alkaryl origin, or mineral oil concentrates thereof, and which have been in the past, conventionally employed as oil additives, with up to the stoichiometric amount of the phosphorus acid, thio acid, oxide or sulfide required to at least partially neutralize the free alkalinity of the overbased sulfonate, filtering therefrom any precipitate formed as a result of such treatment of the sulfonate or oil concentrate thereof, and recovering an oil-soluble alkaline earth metal sulfonate product, or oil concentrate thereof, containing colloidal oil-insoluble alkaline earth metal phosphorus compounds of reducing nature formed in situ.

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3,655,559

## ALKYLATED DIPHENYLAMINES AS STABILIZERS

Brian Holt, Royton, Lancs., England, assignor to CIBA-GEIGY Corporation, Ardsley, N.Y.

Filed Apr. 9, 1970, Ser. No. 27,176
Claims priority, application Great Britain, Apr. 11, 1969, 18,617/69
Int. Cl. C10m *1/34*
U.S. Cl. 252—51.5 A 14 Claims

The use of tris 2,4,4'-alkyldiphenylamines for stabilizing organic material and compositions thereof especially synthetic lubricating oils. Such compositions are stabilized against oxidative deterioration.

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3,655,560

## FUELS AND LUBRICANTS CONTAINING AMINOGUANIDINE ANTIOXIDANTS

Harry J. Andress, Jr., Pitman, N.J., assignor to Mobil Oil Corporation

Filed May 18, 1970, Ser. No. 38,500
Int. Cl. C10m *1/32, 1/36;* C10l *1/22*
U.S. Cl. 252—51.5 A 14 Claims

Organic compositions are provided containing, as improving agents, compounds selected from the group consisting of ketimines of aminoguanidine, aldimines of ketimines of aminoguanidine and aldimines of amides of aminoguanidine. These compounds act as antioxidants and metal deactivators for fuel oils, lubricating oils and greases.

3,655,561

## LUBRICANT COMPOSITIONS CONTAINING ARYL-INDANO SECONDARY AMINES

John W. Schick, Cherry Hill, and Robert M. Gemmill, Jr., Woodbury, both of N.J., assignors to Mobil Oil Corporation

Filed June 24, 1969, Ser. No. 836,168
Int. Cl. C10m *1/34*
U.S. Cl. 252—51.5 A 6 Claims

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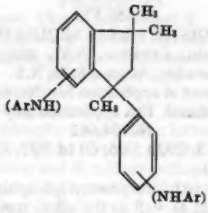
Organic base compositions, subject to oxidative deterioration, are provided containing a stabilizing amount of an aryl-indano secondary amine having the structure:




wherein Ar is phenyl, naphthyl, alkyl substituted phenyl or alkyl substituted naphthyl. The method for the preparation of these aryl-indano secondary amines is also provided.

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3,655,562

## STABLE SYNTHETIC ESTER LUBRICANT COMPOSITION

Tai S. Chao, Homewood, and Allan N. Roush, Park Forest, both of Ill., assignors to Atlantic Richfield Company, New York, N.Y.

Filed Jan. 15, 1970, Ser. No. 3,203
Int. Cl. C10m *1/34*
U.S. Cl. 252—51.5 A 12 Claims

A normally-liquid, synthetic ester base lubricant composition having enhanced oxidation retardation at temperatures greater than 400° F. is disclosed. The composition contains, in addition to the base lubricant, minor amounts of an alpha-alkyl styrenated aromatic amine which is the condensation product of (1) a secondary aromatic mono or diamine having non-olefinic, non-acetylenic hydrocarbon radicals of about one to 20 carbon atoms and at least one non-olefinic, non-acetylenic aromatic hydrocarbon radical of about six to 16 atoms attached to an amine group, and (2) an alpha-alkyl styrene, particularly an alpha-lower alkyl styrene.

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3,655,563

## LUBRICATING COMPOSITION

Eugene M. Fauber, Hammond, Ind., and Hallard C. Moyer, Homewood, Ill., assignors to Atlantic Richfield Company, New York, N.Y.

Filed Apr. 20, 1970, Ser. No. 30,215
Int. Cl. C10m *1/54*
U.S. Cl. 252—59 5 Claims

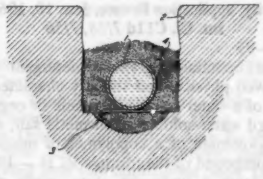
A protective lubricant composition suitable for use as a wire rope lubricant, comprising about 75 to 95 weight percent of an asphalt, about 4 to 20 weight percent of a high viscosity index, distillate mineral lubricating oil and about 0.5 to 15 weight percent of Fischer-Tropsch wax.

3,655,564

## WATER-REPELLANT THERMAL INSULATING COMPOSITION

Jonathan Barrington, Malvern, Pa., assignor to Insul-Fil Manufacturing Company, Primos, Pa.

Filed May 9, 1968, Ser. No. 727,971
Int. Cl. F16l *1/00, 59/00*
U.S. Cl. 252—62 1 Claim



A mixture of hydrophobically coated expanded perlite particles of a particular size with particles of a particular and different size having a hydrophobic surface, which mixture functions as a water-repellant thermal insulation.

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3,655,565

## ELECTRICALLY INSULATING COMPOSITIONS OF DIELECTRIC POLYMER, MICA FLAKES AND SILICONE RESIN

Joseph L. McDonald, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 7, 1970, Ser. No. 1,283
Int. Cl. H01b *3/04, 3/46*
U.S. Cl. 252—63.2 8 Claims

Compositions suitable as electrical insulation comprised of synthetic dielectric polymer, mica flakes having specific surface area of about 7 square meters per gram or greater and a minor amount of a silicone resin that is substantially compatible but not reactive with the polymer. The compositions can withstand high electrical voltages over extended periods of time (being extremely resistant to corona breakdown) and also have good mechanical properties (e.g., toughness, strength and flexibility).

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3,655,566

## BLEACH HAVING STABLE BRIGHTENERS

Ronald A. Robinson, Garden Grove, and Benjamin R. Briggs, Los Alamitos, both of Calif., assignors to Purex Corporation, Ltd., Lakewood, Calif.

Filed Mar. 5, 1970, Ser. No. 16,927
Int. Cl. C11d *7/54*
U.S. Cl. 252—95 12 Claims

Liquid household bleach composition containing optical brighteners protectively carried in the bleach solution against chemical deterioration by a finely particulate sequentially prepared synthetic organic polymer which is dispersed through the bleach solution.

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3,655,567

## BLEACHING AND DETERGENT COMPOSITIONS

Frederick William Gray, Summit, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of application Ser. No. 679,611, Nov. 1, 1967, now abandoned. This application Jan. 11, 1971, Ser. No. 105,653
Int. Cl. C11d *7/54*
U.S. Cl. 252—95 10 Claims

Bleaching and detergent compositions containing a water-soluble peroxide and a water-soluble imide e.g. N-m-chlorobenzoylsuccinimide and N-m-chlorobenzoyl-5,5-dimethyldantoin.

3,655,568

## ENZYME CONTAINING DETERGENT COMPOSITION HAVING IMPROVED PHYSICAL AND STABILITY CHARACTERISTICS

**Wahib Nassif Zaki, 66B Avenue de Tervueren, Brussels, Belgium; Jean Marie Louis Coulomb, Residence Puccini, Rue Antione di Dominico, Martiques, France, and Peter Lovgren, Holmelundsvej 8, 2650 Hvidovre, Copenhagen, Denmark**

**Filed Jan. 5, 1970, Ser. No. 797**
**Claims priority, application France, Jan. 10, 1969, 6900346**
**Int. Cl. C11d** *7/18, 7/56*
**U.S. Cl. 252—99** **6 Claims**

An enzyme containing granular detergent composition having improved physical and stability characteristics which is comprised of a water-soluble inorganic or organic builder, an enzyme and water-soluble alkali metal salt, ester, or $C_{1-2}$ alkyl- or alkylolomide of a copolymer of maleic anhydride and a vinyl compound of the formula RCH — HCR, wherein one R represents a hydrogen atom, while the other R represents a $C_{1-4}$ alkyl ether radical, or a hydrogen atom.

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3,655,569

## DETERGENT COMPOSITIONS CONTAINING A SEQUESTRANT AND OPTIONALLY A BLEACHING AGENT HAVING A REDUCED TENDENCY TO ATTACK COPPER, ZINC AND ALUMINUM

**Martin Hellsten, Odsmal, and Jan Emanuelsson, Stenungsund, both of Sweden, assignors to Mo Och Domsjo Aktiebolag, Ornskoldsvik, Sweden**

**Filed Aug. 6, 1969, Ser. No. 848,084**
**Int. Cl. C11d** *7/54*
**U.S. Cl. 252—99** **17 Claims**

Detergent compositions are provided that are especially formulated with a sequestrant for use in hard water, and optionally, a bleaching agent, and that contain a corrosion inhibitor lessening the tendency of the composition to attack copper, zinc and aluminum.

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3,655,570

## DETERGENT CONTAINING ALKALI PROTEASE

**Masao Isono, Nishinomiya; Katsumi Tomoda, Toyonaka, Osaka; Kouichi Miyata, Takatsuki, Osaka; Kazutaka Maejima, Nishinomiya, and Keisuke Tsubaki, Suita, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan**

**Filed Feb. 3, 1969, Ser. No. 795,951**
**Claims priority, application Japan, Feb. 8, 1968, 43/7863; Mar. 15, 1968, 43/16970**
**Int. Cl. C11d** *7/42, 9/40*
**U.S. Cl. 252—132** **5 Claims**

Alkaline protease if produced by cultivating an alkaline protease-producing microorganism from the genus Fusarium or Giberella in a proper growth supporting medium and the alkaline protease is recovered from the medium. The alkaline protease degrades protein under conditions of high pH and thus is useful in the formulation of detergent and other cleanser compositions.

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3,655,571

## CORROSION INHIBITOR MIXTURE

**Robert J. Tedeschi, Whitehouse Station, and Paul W. Natali, Middletown, both of N.J., assignors to Air Products and Chemicals, Inc., Allentown, Pa.**

**Filed Dec. 31, 1968, Ser. No. 789,022**
**Int. Cl. C23g** *1/06*
**U.S. Cl. 252—148** **4 Claims**

Aqueous acid solutions are inhibited against corrosion of metals, especially ferrous metals, by incorporation of a corrosion-inhibiting mixture composed of a combination of 1-hexyn-3-ol, 5-decyn-4,7-diol and urea.

3,655,572

## WATER-CONTAINING DRY CLEANING COMPOSITIONS

**Alan E. Straus, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.**

**Filed Jan. 21, 1970, Ser. No. 4,736**
**Int. Cl. C09d** *9/04;* **C11d** *7/50;* **C23g** *5/02*
**U.S. Cl. 252—171** **10 Claims**

Combinations of surface active materials which solubilize significant quantities of water in dry cleaning solvents, the combination comprising from 70 to 90 percent by weight of a dialkyl benzene sulfonate in which the alkyl groups are substantially linear and contain from six to 10 carbon atoms and from 10 to 30 percent by weight of a $C_{15-20}$ branched chain monoalkyl benzene sulfonate.

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3,655,573

## SYNERGISTIC METAL SEQUESTRANT

**Ronald H. Carlson, Lewiston, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.**

**Continuation-in-part of application Ser. No. 680,011, Nov. 2, 1967, now abandoned. This application July 13, 1970, Ser. No. 54,662**
**Int. Cl. C02b** *5/06;* **C11d** *7/32, 7/36*
**U.S. Cl. 252—180** **4 Claims**

Mixtures of tris(hydroxymethyl)phosphine oxide, and nitrilotriacetic acid as well as the alkali metal salts thereof, exhibit marked synergism as sequestrant compositions over a broad pH range. The sequestrant compositions are useful as additives for detergents, metal cleaning baths, peroxide compositions and dyes. The chelate products are useful in the field of agriculture for the introduction of trace elements into plant life and especially in the treatment of iron chlorosis in plants.

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3,655,574

## OPTICAL BRIGHTENING COMPOSITION MIXTURE OF THREE ANALOGOUS COMPOUNDS

**Hans Frischkorn; Erich Schinzel, both of Hofheim/Taunus, and Gunter Rosch, Altenhain/Taunus, all of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt/Main, Germany**

**Filed Jan. 12, 1970, Ser. No. 2,396**
**Claims priority, application Germany, Jan. 18, 1969, P 19 02 445.4**
**Int. Cl. C09k** *1/02*
**U.S. Cl. 252—301.2 W** **7 Claims**

An optical brightener composition consisting of an unsymmetrical bis-triazinylamino-stilbene disulfonic acid and of the two corresponding symmetrical compounds is superior to the single components as regards the degree of whiteness obtained thereby and the multiplicity of applications for brightening of fibrous materials of cellulosic and polyamide fibers.

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3,655,575

## CATHODOLUMINESCENT PHOSPHOR COMPOSITIONS

**Sixdeniel Faria, Towanda, and Lyle K. Williams, Wysox, both of Pa., assignors to Sylvania Electric Products Inc.**

**Filed Feb. 2, 1970, Ser. No. 7,450**
**Int. Cl. C09k** *1/12*
**U.S. Cl. 252—301.6 S** **5 Claims**

Cathodoluminescent phosphors exhibiting improved properties and that provide colored emission throughout a substantial portion of the visible range of colors, are disclosed that consist essentially of a zinc sulfide and cadmium sulfide host material having a Zn:Cd weight ratio of about 2:98 to about 98:2 and an activator material having an amount of silver of from about 50 to about 300 ppm by weight based on the weight of the host material and from about 75 to 600 ppm of aluminum on the same basis. The blue-emitting phosphor compositions consisting essentially of a host having a Zn:Cd ratio of from about 90:10 to about 97:3 and an ac-

tivator material having from about 100 to about 300 ppm of silver and from about 75 to about 150 ppm of aluminum are found to have extremely high brightness. Additionally the green-emitting phosphor compositions consisting of a host having a Zn:Cd weight ratio from about 55:45 to about 65:35 and an activator material having from about 50 to about 300 ppm of silver and from about 75 to about 300 ppm of aluminum is also an extremely bright phosphor. Red-emitting phosphors having a Zn:Cd weight ratio of from about 25:75 to about 15:85 and levels of silver and aluminum of from about 100 to 300 ppm are also disclosed.

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**3,655,576**
**PRODUCTION OF CALCIUM HALOPHOSPHATE PHOSPHORS**
**Harry D. Layman, Ulster, and Robert E. Taylor, Towanda, both of Pa., assignors to Sylvania Electric Products Inc.**
**Filed Sept. 8, 1970, Ser. No. 70,550**
**Int. Cl. C09k** *1/36*
**U.S. Cl. 252—301.6 P** **7 Claims**

An improved process for the production of calcium halophosphate phosphors comprising forming a first substantially uniform admixture of (a) a calcium phosphate source selected from mono and di calcium orthophosphates, calcium pyrophosphates and mixtures thereof, (b) a secondary calcium source having a volatile anion, in stoichiometric proportions to form tricalcium orthophosphate, and (c) the desired sources of dopants, heating the first admixture under temperature and time conditions sufficient to form a doped tricalcium orthophosphate, forming a second uniform admixture, in proper molar ratios, of the doped tricalcium orthophosphates and the calcium halide forming ingredients and heating for a sufficient time and temperature to form a calcium halophosphate phosphor.

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**3,655,577**
**PHOSPHORS**
**Tsuyoshi Kano, Higashi-Murayama, Yoshiro Otomo, Mitaka, and Hajime Yamamoto, Kokubunji, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**
**Filed June 24, 1970, Ser. No. 49,250**
**Claims priority, application Japan, June 30, 1969, 44/51,607**
**Int. Cl. C09k** *1/14*
**U.S. Cl. 252—301.4 S** **5 Claims**

An oxy-sulfide phosphor having extremely improved luminescent intensity which comprises europium as an activator; praseodymium or a mixture thereof with terbium as a sensitizer; and a base having a composition capable of making the sensitizing actions of said elements particularly marked.

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**3,655,578**
**HIGH SURFACE AREA STABILIZED SILICA SOLS AND PROCESS FOR PREPARING SAME**
**Paul C. Yates, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**
**No Drawing. Filed May 8, 1969, Ser. No. 823,184**
**Int. Cl. B01j** *13/00;* **C01b** *33/14*
**U.S. Cl. 252—313 S** **14 Claims**

Compositions consisting essentially of colloidal silica sols having a surface area of from 500 m.²/gram to 1500 m.²/gram stabilized with a co-stabilizer system consisting of: (1) an organic or inorganic base having a basic dissociation constant greater than $10^{-5}$ and (2) at least one non-aromatic organic compound having (a) only hydrogen, carbon, and oxygen, (b) at least two oxygen atoms per molecule in the form of hydroxy or ether groups and (c) a water solubility at 25° C. of at least 1%, are useful as refractory film-forming and binding agents. The non-aromatic organic compound may be a sugar, an aliphatic polyol, polyvinyl alcohol or a methyl ether of any of the preceding compounds. The compositions are made by treating an aqueous silicate solution with an ion-exchange resin in the presence of the co-stabilizing agent until the pH is in the range of 10 to 11.5 and the mole ratio of $SiO_2$ to alkali metal oxide is greater than 5:1.

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**3,655,579**
**POWDER GELLING COMPOSITION**
**Homer E. Crotty and Charles R. Coffey, Cincinnati, and Thomas C. Tesdahl, Forest Park, Ohio, assignors to Chemed Corporation, Cincinnati, Ohio**
**No Drawing. Original application Aug. 2, 1968, Ser. No. 749,585, now Patent No. 3,578,499, dated May 11, 1971, Divided and this application Sept. 18, 1970, Ser. No. 73,656**
**Int. Cl. B01j** *13/00*
**U.S. Cl. 252—316** **5 Claims**

The disclosed invention includes a powder gelling composition containing a gelling agent, a neutral diluent, a wetting agent, and desirably a dye or coloring additive. The powder gelling composition when added to water forms a gel. To this gel may be added acid or alkaline materials for cleaning, biocidal agents for sanitizing, or other materials to produce a desired effect. The significant advantage of this method is the increased residence time and hence contact time between agents in the gel and the surface to be acted on.

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**3,655,580**
**AGGLOMERATED SILICA BODIES AND METHOD**
**Raymond Beau, Massy, and Jean Fourniquet, Paris, France, assignors to Produits Chimiques Pechiney-Saint-Gobain, Neuilly-sur-Seine, France**
**No Drawing. Continuation-in-part of application Ser. No. 760,714, Sept. 18, 1968. This application June 3, 1970, Ser. No. 43,219**
**Claims priority, application France, Sept. 20, 1967, 121,591**
**The portion of the term of the patent subsequent to Nov. 3, 1987, has been disclaimed**
**Int. Cl. C01b** *33/16*
**U.S. Cl. 252—317** **7 Claims**

The production of agglomerated bodies of silica wherein a composition formed in whole or in part of silica hydrogel microballs is agglomerated and which includes the treatment of the microballs prior to agglomeration with an alkaline medium to increase the composite strength of the agglomerated bodies.

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**3,655,581**
**COMPOSITION AND PROCESS FOR PREPARING FLEXIBLE POLYESTER BASED POLYURETHANE FOAMS**
**Richard A. Bachura, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.**
**No Drawing. Filed Sept. 25, 1968, Ser. No. 762,613**
**Int. Cl. B01f** *17/00*
**U.S. Cl. 252—351** **7 Claims**

A composition is disclosed which consists essentially of (1) 75 to 95 percent by weight of a trimethylsilyl endblocked siloxane-polyoxyethylene copolymer, and (2) 5 to 25 percent by weight of a fatty acid having from 10 to 40 carbon atoms. This composition is useful as a surfactant in the preparation of flexible polyester based polyurethane foams where it minimizes problems of splitting

and shrinkage of the foams, promotes uniformity of cell size, promotes compatibility of the reactants and catalyst, and allows wider processing and formulation latitude.

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3,655,582

## SYNERGISTIC COMBINATION OF SILICATES AND BARIUM SALTS FOR INHIBITING THE ATTACK OF ALKALINE SOLUTIONS ON ALUMINUM CONTAINING MATERIALS

**Jean Dupre, Levittown, and Keith A. Booman, Dresher, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.**

**No Drawing. Filed June 18, 1969, Ser. No. 834,499**

**Int. Cl. C23f** *11/18, 11/06*

**U.S. Cl. 252—387** **1 Claim**

Materials which are principally comprised of aluminum, and which are sensitive to the attack of alkaline solutions, are protected against such attack by a synergistic combination of water soluble silicates and barium salts, with or without well-known surface active agents and solvents.

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3,655,583

## VANADYE COMPOUND HAVING CYCLIC HYDROCARBON SUBSTITUENT AND POLYMERIZATION CATALYST CONTAINING SAID COMPOUND

**Keisaku Yamamoto, Ibaraki, Hiroyoshi Takao, Takatsuki, Masaaki Hirooka, Ibaraki, and Teruo Oshima, Nishinomiya, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan**

**No Drawing. Filed July 23, 1969, Ser. No. 844,178**

**Claims priority, application Japan, July 30, 1968, 43/53,816**

**Int. Cl. C08f** *15/04, 3/02, 3/04*

**U.S. Cl. 252—431** **24 Claims**

Novel vanadyl compounds of the formula

$$VO(OR)_mX_{3-m}$$

where R is a group containing a cyclic hydrocarbon having 5 to 20 carbon atoms, X is a halogen atom and *m* is an integer from 1 to 3, are mixed with organoaluminum compounds to make catalysts useful for homopolymerizing or copolymerizing alpha-monoolefins in solution, if desired with a polyene such as a conjugated or non-conjugated diene. Examples of the vanadium compounds are vanadyl tricyclohexoxide, monochlorovanadyl dicyclohexoxide, vanadyl tribornyloxide and monochlorovanadyl dinorbornylmethoxide. Conjugated dienes have less retarding effect on the catalyst than on conventional catalyst.

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3,655,584

## CATALYST FOR THE RING OPENING POLYMERISATION OF CYCLOPENTENE

**Wolfgang Oberkirch, Cologne, Peter Gunther, Opladen, and Gottfried Pampus, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany**

**No Drawing. Filed Apr. 20, 1970, Ser. No. 30,336**

**Int. Cl. C08f** *5/00*

**U.S. Cl. 252—429 A** **2 Claims**

Catalyst for producing homo- and copolymers of cyclopentene comprising tungsten hexachloride which has been irradiated with light of a wave length of up to 7000 A. and an organo aluminum compound.

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3,655,585

## METHOD OF PREPARING CATHODIC ELECTRODES

**Arabinda N. Dey, Needham, and Bernard P. Sullivan, Bedford, Mass., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.**

**Filed Aug. 28, 1969, Ser. No. 853,817**

**Int. Cl. H01b** *1/06;* **C01g** *31/00*

**U.S. Cl. 252—506** **10 Claims**

A method for preparing cathodes having vanadium pentoxide active cathode material wherein direct use of vanadium pentoxide is not required. Electrodes having high porosity and providing highly efficient utilization of active cathode material are provided by pyrolytic decomposition of a pentavalent vanadium salt admixed with particulate conductive filler.

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3,655,586

## COPOLYMERS OF CYCLIC PHOSPHATES AND EPOXIDES OR ALDEHYDES

**Edwin J. Vandenberg, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.**

**No Drawing. Continuation-in-part of application Ser. No. 690,433, Dec. 14, 1967. This application Feb. 13, 1970, Ser. No. 11,338**

**The portion of the term of the patent subsequent to July 21, 1987, has been disclaimed**

**Int. Cl. C08g** *33/16, 37/36*

**U.S. Cl. 260—2 P** **10 Claims**

Solid copolymers of cyclic phosphates such as alkylene alkyl phosphates and phenylene alkyl phosphates with epoxides such as epichlorohydrin or ethylene oxide or with aldehydes such as trioxane are provided.

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3,655,587

## METHODS AND DEVICES FOR THE REGENERATION OF ION EXCHANGERS

**Jean Bouchard, Paris, Roger Frison, Nanterre, and Pierre Treille, Saint-Cloud, France, assignors to Degremont, Societe Generale d'Epuration et d'Assainissement, Rueil-Malmaison, France**

**Filed Sept. 11, 1970, Ser. No. 71,310**

**Claims priority, application France, Oct. 14, 1969, 35,091**

**Int. Cl. B01d** *15/06;* **C02b** *1/76*

**U.S. Cl. 260—2.1 R** **8 Claims**

Method for regeneration of ion exchangers having the same ionic nature and disposed in superposed layers in the same apparatus, said ions being saturated by circulating the liquid to be treated in downward flow through the superposed layers of ion exchangers which are regenerated by circulating the regeneration reagent in countercurrent flow through the layers of ion exchangers. At least one regeneration reagent is passed upwards through the different superposed layers of ion exchangers and at least one additional stream of liquid is introduced in the vicinity of the interface between two superposed layers of ion exchangers, said additional stream being also circulated upwards through the layer or layers of ion exchangers together with the stream of regeneration reagent.

3,655,588
**URETHANE-CONTAINING AMINIC POLYOLS AND FOAMS DERIVED THEREFROM**
**Paul R. Mosso, Natrona Heights, and Carl R. Faelten, Pittsburgh, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.**
**No Drawing. Filed Jan. 2, 1970, Ser. No. 384**
**Int. Cl. C08g** *22/48*
**U.S. Cl. 260—2.5 AM** **26 Claims**

This invention relates to novel polyols containing urethane groups derived by coupling an aminic polyol with a polyisocyanate. Moreover, this invention relates to novel polyurethane resins, particularly novel polyurethane foams, prepared from the polyols of the invention.

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3,655,589
**FLAMEPROOFED ORGANIC SYNTHETIC RESINS**
**Frank Wingler, Leverkusen, Werner Dietrich, Cologne-Stammheim, Herbert Bartl, Odenthal-Hahnenberg, and Karl-Josef Kraft, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany**
**No Drawing. Filed Mar. 11, 1970, Ser. No. 18,760**
**Claims priority, application Germany, Mar. 27, 1969, P 19 15 681.1**
**Int. Cl. C08g** *53/10, 22/44;* **C08f** *37/16*
**U.S. Cl. 260—2.5 FP** **2 Claims**

Mixtures of 30 to 95% by weight of an organic synthetic resin and 5 to 70% by weight of a halogen-containing copolymer of 2 to 30% by weight of ethylene and/or propylene, α-butylene or isobutylene, 98 to 20% by weight of a halogen-containing α-olefin and, if desired, 0 to 40% by weight of an OH-containing copolymerizable monomer and 0 to 50% by weight of a halogen-containing telogen.

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3,655,590
**POLYURETHANE FOAMS PREPARED FROM STARCH-BASED POLYETHER POLYOLS**
**Philip H. Moss and Michael Cuscurida, Austin, Tex., assignors to Jefferson Chemical Company, Inc., Houston, Tex.**
**No Drawing. Filed June 29, 1970, Ser. No. 50,901**
**Int. Cl. C08g** *22/46, 22/14;* **C08b** *19/06*
**U.S. Cl. 260—2.5 AS** **4 Claims**

A low cost, easily prepared rigid polyurethane polyol of low viscosity may be made by reacting corn starch with glycol ethers and alkoxylating the product. The polyol may be used to prepare high quality rigid polyurethane foam. Rigid polyurethane foam is an excellent heat insulator and structural material.

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3,655,591
**OPAQUE, NON-PIGMENTED MICROPOROUS FILM AND PROCESS AND COMPOSITION FOR PREPARING THE SAME**
**Jerome A. Seiner, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.**
**Continuation-in-part of application Ser. No. 524,953, Feb. 1, 1966. This application Jan. 13, 1970, Ser. No. 2,534**
**Int. Cl. C08** *1/26*
**U.S. Cl. 260—2.5 M** **29 Claims**

This invention relates to films which are opaque and microporous, but which do not contain pigments to enhance their whiteness. The continuous, opaque films are prepared by mixing a homogeneous solution of thermosetting polymeric material with a solvent mixture for said polymeric material comprising at least two miscible liquids, at least one of said liquids being a non-solvent for said polymeric material and having a lower volatility than that of the other liquids in said mixture. Upon curing of the resin material, the non-solvent which is precipitated in the resin matrix is evaporated to form a film containing discrete closed cells. The films are useful in producing heat and mar resistant paints and coatings without the addition of costly pigments.

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3,655,592
**EXPANSIBLE PEARLS CONTAINING ETHYL-ETHYLENE, PROPYLENE, AND $SO_2$ GROUPS IN A COPOLYMER AND PROCESSES OF MAKING THEM**
**Jean Chatelain, Lyon, France, assignor to Produits Chimiques Pechiney-Saint-Gobain, Neuilly-sur-Seine, France**
**No Drawing. Filed Aug. 29, 1968, Ser. No. 756,291**
**Claims priority, application France, Aug. 30, 1967, 119,424; July 22, 1968, 160,075**
**Int. Cl. C08f** *47/10, 13/06*
**U.S. Cl. 260—2.5 B** **10 Claims**

Expansible pearls containing propylene, ethyl-ethylene, and $SO_2$ groups with butene-1 and propane. They are useful as adjuvants to soil in agriculture, as insulation against sound and heat, and to make cellular articles by molding.

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3,655,593
**POLYMERIC ORGANIC PHOSPHORUS COMPOUNDS**
**John H. Johnson and William R. Richard, Jr., Kirkwood, Mo., assignors to Monsanto Company, St. Louis, Mo.**
**No Drawing. Continuation-in-part of application Ser. No. 849,246, July 29, 1969, which is a continuation-in-part of application Ser. No. 392,601, Aug. 27, 1964. This application June 29, 1970, Ser. No. 50,921**
**Int. Cl. C08g** *1/08, 15/00*
**U.S. Cl. 260—9** **4 Claims**

A flameproofing composition which is formed by the reaction product of a trivalent phosphorus halide compound having at least one chlorine or bromine atom attached to the phosphorus atom, a carbonyl compound which is an aldehyde or a ketone, and an ester of a trivalent phosphorus atom. The carbonyl compound may be (1) copolymerization products of olefins with carbon monoxide, such as ethylene/carbon monoxide copolymers, (2) vinyl ketone polymers, (3) polymers with appended aldehyde groups and (4) polymeric dialdehyde starches.

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3,655,594
**ACRYLIC RESIN CONTAINING TOUCH-UP FILLER COMPOUND**
**Joseph J. Medica, St. Petersburg, Kenneth G. Trout, Tampa, and Stanley C. Kyminas, St. Petersburg, Fla., assignors to The Celotex Corporation, Tampa, Fla.**
**No Drawing. Filed Aug. 13, 1969, Ser. No. 849,864**
**Int. Cl. C09d** *5/34*
**U.S. Cl. 260—17 R** **3 Claims**

A single application filler compound for touching up gouges in fiberboard products contains about 50% by weight of a water base thermoplastic acrylic copolymer with a low pigment to binder ratio and a high viscosity.

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3,655,595
**EPOXY BINDER FOR MAGNETIC COATING COMPOSITION**
**Louis M. Higashi, Monte Sereno, Calif., assignor to Memorex Corporation, Santa Clara, Calif.**
**No Drawing. Filed Feb. 20, 1969, Ser. No. 801,193**
**Int. Cl. C08g** *30/16*
**U.S. Cl. 260—18 EP** **5 Claims**

A fluid, thermosetting magnetic coating composition comprising magnetic particles and a film-forming composition or binder stable at room temperatures. The binder or film-forming composition comprises an adduct based upon dimer acid and the diglycidyl ether of bisphenol A with terminal oxirane rings, and having a molecular weight of from about 800 to about 5000 and an epoxide

equivalent weight of from about 400 to about 2600 and adapted to form a flexible film upon hardening, a fatty acid polyamide, and a curing agent comprising an amine and a Lewis acid-alkyl amine complex salt.

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3,655,596
**SHORT OIL ALKYD RESINS**

**Haruo Kozu, Morio Kimura, Tadashi Watanabe, and Naozumi Iwasawa, Hiratsuka, and Michio Yoshida, Amagasaki, Japan, assignors to Kansai Paint Company, Limited, Amagasaki-shi, Japan**

**No Drawing. Filed Mar. 18, 1970, Ser. No. 20,813**
**Claims priority, application Japan, Mar. 26, 1969, 44/22,364**
**Int. Cl. C08g *17/16*; C09d *3/64***
**U.S. Cl. 260—22 R** **9 Claims**

Short oil alkyd resins suitable for use in both baking type and non-baking type paints, and being excellent in hardness, toughness, chemical resistance, compatibilty with other film-forming materials, etc., and being made from polybasic acids, glycols and tetrahydric and/or trihydric alcohols, and saturated and/or unsaturated fatty acids having 6–18 carbon atoms.

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3,655,597
**SINGLE-STEP PROCESS FOR PREPARING A CELLULAR PRODUCT HAVING A VERY COMPACT ELASTOMERIC SKIN**

**Albert Pierre Strassel, Ville d'Avray, France, assignor to Wyandotte Chemicals Corporation, Wyandotte, Mich.**

**No Drawing. Continuation of application Ser. No. 672,726, Oct. 4, 1967. This application May 4, 1970, Ser. No. 31,883**
**Claims priority, application France, Dec. 26, 1966, 88,838**
**Int. Cl. C08g *53/10***
**U.S. Cl. 260—2.5 AZ** **2 Claims**

Molded polyurethane-polyurea products having a cellular body with a thick, adherent skin having a high density are produced by a process in which the rate at which the various ingredients react is adjusted as a function of the quantity of water present in the ingredients.

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3,655,598
**SILICONE-POLYBUTADIENE RESINS**

**Robert C. Antonen and Gust J. Kookootsedes, Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.**

**No Drawing. Filed June 29, 1970, Ser. No. 50,987**
**Int. Cl. C08k *1/66***
**U.S. Cl. 260—18 S** **9 Claims**

Silicone-polybutadiene resins wherein a siloxy-terminated polybutadiene having vinyl groups on alternate carbon atoms of the diene backbone is condensed by means of functionality on the silicon atoms with a hydroxyl-functional organosilicon resin, the vinyl groups of the diene being cyclized by means of an organic peroxide catalyst, have utility as protective coatings.

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3,655,599
**RUBBER ACCELERATORS FOR LIQUID COMPOUNDING**

**Edward L. Kay and Joseph A. Beckman, Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio**

**No Drawing. Filed May 18, 1970, Ser. No. 38,283**
**Int. Cl. C08c *9/00, 11/54***
**U.S. Cl. 260—23.7 M** **6 Claims**

Bis(2 - alkylamino-4-dialkylamino-6-triazinyl) disulfide and 2-diethylamino - 4 - amino - 6 - cyclohexylaminothiotriazine and the like are accelerators used in the liquid compounding of a rubber polymer derived at least in part from a diene.

3,655,600
**FLAME RESISTANT MATERIALS AND METHODS FOR PRODUCING SAME**

**Stephen S. Stevens, Encino, Calif., assignor of fractional part interest to Morris Sankary**

**No Drawing. Filed Jan. 13, 1970, Ser. No. 2,690**
**Int. Cl. C08j *1/30***
**U.S. Cl. 260—2.5 B** **13 Claims**

A flame resistant material formed by dry blending a combination of finely powdered alkali metal silicate, an inorganic filler and a plurality of porous expanded polymer beads or granules with a minor amount of an alkali stable surfactant which wets the surfaces of the beads and permits the adhesion of the powdered alkali metal silicate thereto, such as a long chain alkyl phenoxy polyethoxy ethanol, and thereafter coalescing said alkali metal silicate with heat to form an integral porous structure.

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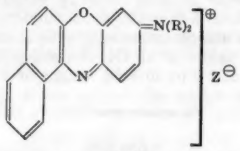
3,655,601
**PROCESS FOR THE MANUFACTURE OF BASIC OXAZINE DYESTUFFS**

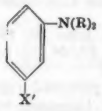
**Norbert Ottawa and Gustav Schafer, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany**

**No Drawing. Filed Feb. 13, 1969, Ser. No. 799,085**
**Int. Cl. C07d *87/50***
**U.S. Cl. 260—242** **10 Claims**

In the process for the manufacture of basic oxazine dyestuffs of the formula



in which R represents an alkyl group of from 1 to 4 carbon atoms and $Z^{\ominus}$ repersents $Cl^-$ or $ZnCl_3^-$ by heating an amine of the formula



in which R is defined as above and X′ represents a hydrogen atom or an alkoxy group of from 1 to 4 carbon atoms, with nitrous acid in an aqueous-acetic acid or aqueous-alcoholic solution and condensing the p-nitroso compound so obtained with β-naphthol, the improvement which comprises condensing the suspension of the p-nitroso compound obtained as described above with the β-naphthol without being intermediately isolated.

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3,655,602
**SILICONE-CONTAINING HYDROPHYLIC RESINS DISPERSIBLE IN WATER**

**Kazys Sekmakas, Chicago, Ill., assignor to DeSoto, Inc., Chicago, Ill.**

**No Drawing. Continuation-in-part of applications Ser. No. 478,736, Aug. 10, 1965, and Ser. No. 605,607, Dec. 29, 1966. This application Aug. 16, 1967, Ser. No. 660,931**
**The portion of the term of the patent subsequent to Sept. 23, 1986, has been disclaimed**
**Int. Cl. C08g *31/16***
**U.S. Cl. 260—29.2 M** **15 Claims**

Silicone-containing hydrophylic resins that are dispersible in water with the aid of a base and water miscible organic solvents are formed from solution addition copolymers having OH or alkoxy-functional silicon-containing material condensed therein as an ether. The hydroxy functionality is preferably provided by reacting

a portion of the carboxy functionality of the copolymers with a monoepoxide. Organopolysiloxanes are preferably used and these can be condensed with hydroxy monomers and then polymerized or the condensation reaction can be carried out with the hydroxy functional polymer. Aqueous dispersions of the resin having minimum acid number and a pH above 8.4 are particularly adapted to be electrodeposited at the anode where the silicone component adds gloss and whether resistance. Cure is preferably effected using aminoplast resins, especially water insoluble heat-hardening benzoguanamine-formaldehyde resin which deposit in direct proportion to the concentration thereof by association in the electrocoating bath with the resins of the invention. Deposited films may be baked to form solvent resistant coatings with the aminoplast resin aiding the cure.

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**3,655,603**

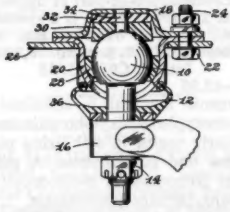
**RESIN IMPREGNATED FIBROUS MATERIAL HAVING LOW FRICTION**

**Henry Clifford Morton, East Greenbush, and Thomas J. Rasmussen, Schenectady, N.Y., assignors to The Bendix Corporation**

**Continuation-in-part of application Ser. No. 577,297, Sept. 6, 1966. This application Dec. 26, 1969, Ser. No. 888,547**

**Int. Cl. C08g** *51/24*

**U.S. Cl. 260—29.3** **8 Claims**




A bearing material having a resin impregnated matrix is disclosed herein. The resin is a reaction product of a homogeneous distribution of tetrafluoroethylene particles and a sulfomethylated phenolic resin which is subsequently polymerized after having impregnated a suitable matrix material and been formed into the desired shape.

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**3,655,604**

**COATING COMPOSITIONS CONTAINING FLUOROCARBON POLYMER AND COLLOIDAL SILICA**

**Clifford H. Strolle, Springfield, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**No Drawing. Filed May 15, 1969, Ser. No. 825,041**

**Int. Cl. C08f** *45/24*

**U.S. Cl. 260—29.6 F** **6 Claims**

A composition for priming a surface to improve adhesion of a fluorocarbon polymer topcoat. The composition contains an ammonia stabilized colloidal silica sol, a particulate fluorocarbon polymer and a liquid carrier.

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**3,655,605**

**SURGICAL CEMENTS FROM ZINC OXIDE AND AQUEOUS POLY(ACRYLIC ACID)**

**Dennis Clifford Smith, Cheadle Hulme, England, assignor to National Research Development Corporation, London, England**

**No Drawing. Continuation-in-part of application Ser. No. 692,711, Dec. 22, 1967. This application June 26, 1969, Ser. No. 836,991**

**Claims priority, application Great Britain, Dec. 30, 1966, 58,472/66**

**Int. Cl. C08f** *29/34;* **A61k** *5/00*

**U.S. Cl. 260—29.6 M** **22 Claims**

Dental cements are prepared by mixing a surgical grade zinc oxide powder with an aqueous solution of polyacrylic acid to give a plastic mass that rapidly hardens. Typical solutions contain about 42% by weight polyacrylic acid having a viscosity determined molecular weight of about 25,000 or about 55,000 to 80,000. The cements have greater adhesion and cause less irritation than conventional zinc phosphate cements.

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**3,655,606**

**HEAT STABILIZATION OF POLYIMIDES FORMED FROM 3,4 - DICARBOXY-1,2,3,4-TETRAHYDRO-1-NAPHTHALENE SUCCINIC DIANHYDRIDES AND DiPRIMARY DIAMINES**

**Howard Robert Lucas, Danbury, Conn., assignor to American Cyanamid Company, Stamford, Conn.**

**No Drawing. Filed Apr. 1, 1971, Ser. No. 130,525**

**Int. Cl. C08g** *51/62*

**U.S. Cl. 260—32.6 N** **7 Claims**

There is provided a heat-stabilized resinous polyimide obtained by incorporating into an inert organic solid solution of a polyimide resinous reaction product of 3,4-dicarboxy - 1,2,3,4 - tetrahydro - 1 - naphthalene succinic dianhydride (Tetralin dianhydride) and a diprimary diamine, a small but effective stabilizing quantity of either ferrocene or benzoyl ferrocene ranging from about 0.25% to about 2.5%, based on the weight of the polyimide solids.

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**3,655,607**

**FLAME-RESISTANT RESISTOR COATINGS**

**Lawrence G. Bockstie, Jr., Bradford, Pa., assignor to Corning Glass Works, Corning, N.Y.**

**No Drawing. Filed July 11, 1967, Ser. No. 652,412**

**Int. Cl. C08g** *41/02;* **C09d** *5/18*

**U.S. Cl. 260—33.8** **5 Claims**

Flame resistant polyimide resistory coatings containing chlorinated polyphenyl and antimonyl trioxide.

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**3,655,608**

**PAPER COATING COMPOSITIONS AND PAPER THEREWITH**

**Karl R. Guenther Middletown, and Donald G. Havekost, Madison, Wis., assignors to Bergstrom Paper Company**

**No Drawing. Filed Jan. 7, 1969, Ser. No. 789,616**

**Int. Cl. C08g** *51/02, 51/04, 51/06*

**U.S. Cl. 260—37 N** **36 Claims**

A process by which paper coating pigments are treated with a hydroxyl- or hydrogen-reactive organic chemical and subsequently combined with a polymerizable binder material to form a uniform, high-pigment-content, thixotropic water-free coating composition to be applied to paper, film, or web materials to produce a smooth coated product with superior properties, and the product thereof.

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**3,655,609**

**BINDER MIXTURE FOR FRICTION ELEMENTS COMPRISING PHENOLIC RESIN AND PRECIPITATED SILICATE**

**Edward Michael Evans, Penarth, Glamorgan, and Kerry David Jeffreys, Rhiwbina, Cardiff, Wales, assignors to BP Chemicals (U.K.) Limited, London, England**

**No Drawing. Filed Sept. 30, 1969, Ser. No. 862,497**

**Claims priority, application Great Britain, Oct. 4, 1968, 47,091/68**

**Int. Cl. C08g** *37/14*

**U.S. Cl. 260—38** **8 Claims**

Binder resin compositions for the preparation of friction elements e.g. brake and clutch linings having good hot wear properties comprise from 5 to 95 parts by weight of a phenolic resin and from 95 to 5 parts by weight of a precipitated alkali metal silicate. The resins

may be compounded with conventional additives, e.g. asbestos and barytes and moulded under heat and pressure to form friction elements.

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3,655,610

## FLUOROPOLYMER COATING COMPOSITIONS

Joseph A. Vasta, Woodbury, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed May 21, 1970, Ser. No. 39,575
Int. Cl. C08g *51/04*
U.S. Cl. 260—39 R 10 Claims

A coating composition containing a tetrafluoroethylene/hexafluoropropylene copolymer, an epoxy resin, an aminoplast resin and zinc, all in an organic liquid, useful for lining water heaters and the like.

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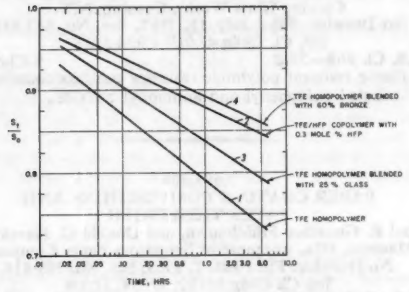
3,655,611

## COLD FLOW RESISTANT HOMOGENEOUS POLYMERS OF TETRAFLUOROETHYLENE AND HEXAFLUOROPROPENE AND PROCESS FOR PREPARING THEM

Max B. Mueller, Morristown, Peter P. Salatiello, Morris Plains, and Herman S. Kaufman, Teaneck, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Aug. 9, 1968, Ser. No. 751,554
Int. Cl. C08f *15/06, 45/04*
U.S. Cl. 260—41 7 Claims




Granular homogeneous copolymers of tetrafluoroethylene and between about 0.05 mole percent and about 0.50 mole percent of hexafluoropropene having superior physical properties and adapted for molding into objects having enhanced resistance to cold flow under loads and process for preparing them.

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3,655,612

## PRESERVATIVE AND IMPERVIOUS SURFACE COATING PASTE

Gianfranco Stella, Milan, Italy, assignor to MPM-Materiali Protettivi Milano S.R.L., Milan, Italy

No Drawing. Filed Dec. 31, 1968, Ser. No. 788,346
Claims priority, application Italy, Nov. 2, 1968, 11,574A/68, Patent 828,105
Int. Cl. C08c *11/16*
U.S. Cl. 260—41.5 2 Claims

A preservative and impervious surface coating paste, consisting of a mixture of a vehicle made of an elastomer, a pigment made of a metal powder, preferably aluminum or copper, a thickener made of a fibrous filler and an additive of synthetic resins, which may be applied in a single coat to any supporting surface without requiring undercoats, fillers or primers.

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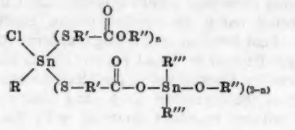
3,655,613

## STABILIZED HALO-VINYL RESIN COMPOSITIONS

Anatole Wowk, Edison, N.J., assignor to M & T Chemicals Inc., New York, N.Y.

No Drawing. Filed June 15, 1970, Ser. No. 46,483
Int. Cl. C08f *45/62*
U.S. Cl. 260—45.75 K 14 Claims

This invention comprises novel compounds exhibiting the formula:



wherein R, R′, R″ and R‴ are hydrocarbons and *n* is 0 or 1, methods of preparing these novel compounds, and polymers stabilized by these novel compounds against the deteriorative effects of heat and light.

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3,655,614

## STABILIZED POLYOLEFIN COMPOSITIONS CONTAINING ALKYLATED p-HYDROXYPHENYLALKYLPHOSPHINATES

John Denon Spivack, Spring Valley, N.Y., assignor to Ciba-Geigy Corporation, Greenburgh, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 618,988, Feb. 27, 1967, which is a continuation-in-part of application Ser. No. 612,336, Jan. 30, 1967. This application Sept. 30, 1970, Ser. No. 76,970
Int. Cl. C08f *45/58*
U.S. Cl. 260—45.95 4 Claims

Unstable organic material is stabilized with certain alkylated p-hydroxyphenylalkylphosphinates. This invention is particularly useful in stabilizing polyolefins such as polypropylene and polyethylene. A particularly preferred stabilizer compound is n-octadecyl(3,5-di-tert.-butyl-4-hydroxybenzyl)ethane phosphinate.

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3,655,615

## COMPOUNDS CONTAINING SILICON AND NITROGEN

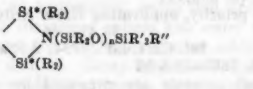
Richard P. Bush, Penarth, and Bryan Thomas, Tonyrefail, Wales (both % Midland Silicones Limited, Reading, England)

No Drawing. Filed Feb. 2, 1970, Ser. No. 8,017
Int. Cl. C08f *11/04*
U.S. Cl. 260—46.5 E 6 Claims

Organosilicon polymers, for example, those containing units of the general formula

$$[—R^4R'_2Si(OSiR_2)_nQ(R_2SiO)_nSiR'_2 \quad R^4Si(R^5)_2(OSiR^5_2)_p—]$$

wherein R is a lower alkyl radical or phenyl radical, R′ and $R^5$ are monovalent hydrocarbon or monovalent halogenated hydrocarbon radicals free of aliphatic unsaturation, R″ is a hydrocarbon radical containing aliphatic unsaturation, $R^4$ is a divalent hydrocarbon radical, Q represents a cyclic silazane or cyclic siloxazane structure which is attached to adjacent silicon atoms through silicon-nitrogen linkages, *n* is 0 or 1 and *p* is 0 or an integer, are prepared by reacting (A) an organosilicon compound containing at least one Si-bonded hydrogen atom with (B) a cyclic silazane or siloxazane containing from 1 to 3 inclusive groups of structure



These polymers are useful as lubricants and elastomers.

3,655,616

## STABILIZED HALOGEN-CONTAINING RESINS

James T. Freeze, Huntington, N.Y., and Alan L. Fikes, Dublin, Calif., assignors to Pfizer Inc., New York, N.Y.

No Drawing. Continuation of application Ser. No. 598,942, Dec. 5, 1966, which is a continuation-in-part of application Ser. No. 398,065, Sept. 21, 1964. This application Oct. 20, 1970, Ser. No. 82,519

Int. Cl. C08f *45/62*

U.S. Cl. 260—45.75 K 2 Claims

Mixtures of sulfur-containing organo-tin compounds and organo-tin maleates as stabilizers for halogen-containing resins.

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3,655,617

## HARDENING OF POLYEPOXY COMPOUNDS WITH DICYANDIAMIDE AND A HETEROCYCLIC SECONDARY AMINE ACCELERATOR

Wolfgang Imoehl, Unna, and Peter Borner, Altlunen, Germany, assignors to Schering AG., Bergkamen, Germany

No Drawing. Filed Feb. 13, 1970, Ser. No. 11,288

Claims priority, application Germany, Feb. 18, 1969, P 19 08 752.6

Int. Cl. C08g *30/14*

U.S. Cl. 260—47 EN 15 Claims

Process for hardening polyepoxides with dicyandiamide in the additional presence of a heterocyclic accelerator containing an imine group. Thermally hardenable mixtures comprising a polyepoxide, dicyandiamide, and such a heterocyclic accelerator. Hardening agents for polyepoxides comprising dicyandiamide and the reaction product of such a heterocyclic accelerator with a polyepoxide compound.

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3,655,618

## POLYVINYL HALIDE THIOETHER POLYMERS

Edward D. Weil, Yonkers, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 651,689, July 7, 1967. This application Apr. 9, 1970, Ser. No. 27,115

Int. Cl. C08f *27/06, 27/07*

U.S. Cl. 260—47 UP 5 Claims

Polyvinyl halide thioethers having aryl groups substituted on sulfur and wherein the polymers are of from 20,000 to 100,000 number average molecular weight are prepared by the displacement of halogen in polyvinyl halide with an aryl mercaptide in a polar solvent at elevated temperature in the presence of substantially equivalent amount of an alkali metal alkylate. The polymer is characterized by having substantially greater thermostability as compared to the unmodified polyvinyl halide polymer, good curability with formaldehyde in the manner of a phenolic and greater receptivity to dyes as compared to the unreacted polyvinyl halide, for example.

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3,655,619

## ALKOXYLATED MANNICH BASE URETHANE PREPOLYMER COMPOSITION AND METHOD OF PREPARATION

Lucien Sellet, Saddle River, N.J., assignor to Diamond Alkali Company

No Drawing. Original application Aug. 22, 1966, Ser. No. 573,789. Divided and this application Jan. 24, 1969, Ser. No. 807,154

Int. Cl. C08g *22/08*

U.S. Cl. 260—47 CB 2 Claims

Treating agents which are the reaction product of an hydroxyl containing nitrogen compound, an isocyanate terminated urethane prepolymer and an acid or quaternizing agent, said reaction products being useful in the treatment of fibrous, porous and nonporous substrates.

3,655,620

## 2-CARBOXY-4,4,6-TRIMETHYL-2,5-HEPTADIENOIC ACID

Marc Julia, Paris, France, assignor to Rhone-Poulenc S.A., Paris, France

No Drawing. Original application Oct. 9, 1967, Ser. No. 673,994, now Patent No. 3,558,659, dated Jan. 26, 1971. Divided and this application May 1, 1969, Ser. No. 843,249

Claims priority, application France, Oct. 12, 1966, 79,723; Feb. 24, 1967, 96,477, 96,478

Int. Cl. C07c *57/02*

U.S. Cl. 260—537 N 1 Claim

Pyrocine, an intermediate in the preparation of chrysanthemic acid, is made by cyclizing 2-carboxy-4,4,6-trimethyl-2,5-heptadienoic acid.

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3,655,621

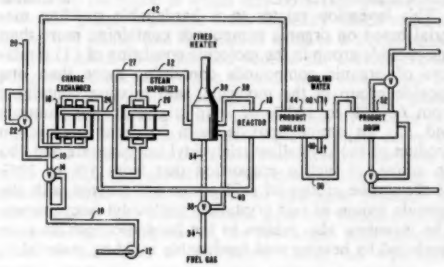
## ADDING MERCAPTAN SULFUR TO A SELECTIVE HYDROGENATION PROCESS

Archibald S. Kasperik, Palos Verdes Estates, Calif., and Herbert A. Fuchs, El Dorado, Ark., assignors to Signal Oil and Gas Company, Los Angeles, Calif.

Continuation-in-part of application Ser. No. 739,904, June 14, 1968, which is a continuation of application Ser. No. 490,518, Sept. 27, 1965. This application Mar. 23, 1970, Ser. No. 21,621

Int. Cl. C07c *11/08;* C10g *23/02*

U.S. Cl. 260—677 H 12 Claims




A process for reducing the sulfuric acid requirements of a $C_4$ hydrocarbon-containing alkylation feed comprises selectively hydrogenating acid polymerizable materials selected from the group consisting of butadiene, ethyl acetylene, and mixtures thereof to butylene in a $C_4$ hydrocarbon-containing stream in the presence of a presulfided high nickel content catalyst and hydrogen in the vapor state at about 300–500° F. and in the presence of at least about 1 grain of mercaptan per 100 s.c.f. of the stream and in the substantial absence of sulfur-bearing nickel catalyst poisons.

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3,655,622

## POLYESTER RESINS FROM 5-CARBOXY-m-PHENYLENEDIACETIC ACID

Martin Hauser, West Hartford, Conn., and Christine Elizabeth Holnacki, Vienna, Va., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Original application June 29, 1967, Ser. No. 651,648. Divided and this application June 3, 1969, Ser. No. 830,099

Int. Cl. C08g *17/04*

U.S. Cl. 260—75 R 4 Claims

A new compound, i.e. 5-carboxy-m-phenylenediacetic acid, new carboxy-terminated polyester resins produced

therefrom with a saturated dicarboxylic acid and a saturated diol and rocket propellant compositions containing said polyesters as binders are disclosed.

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3,655,623

**SEGMENTED POLYURETHANES DERIVED FROM 2,5-DIISOPROPYL-p-XYLENE DIISOCYANATE**

**Elmore L. Martin, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**No Drawing. Original application Dec. 30, 1966, Ser. No. 605,967, now Patent No. 3,542,839. Divided and this application June 16, 1970, Ser. No. 46,816**

**Int. Cl. C08g *22/22***

**U.S. Cl. 260—77.5 AT** **10 Claims**

Segmented polyurethanes based on 2,5-diisopropyl-p-xylylene diisocyanate as capping reagent provide spandex fibers and films which exhibit high whiteness retention and high elastic power. The diisocyanate may be prepared from 2,5-diisopropyl-p-xylylenediamine.

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3,655,624

**MOLDING MATERIALS BASED ON EPOXIDE COMPOUNDS**

**Herbert Saran and Manfred Budnowski, Dusseldorf-Holthausen, Germany, assignors to Henkel & Cie, GmbH, Dusseldorf-Holthausen, Germany**

**No Drawing. Filed Aug. 19, 1968, Ser. No. 753,781**

**Claims priority, application Germany, Oct. 20, 1967, H 64,229**

**Int. Cl. C08g *30/14***

**U.S. Cl. 260—77.5 NC** **2 Claims**

This invention relates to a hardenable molding material based on organic compounds containing more than one epoxide group in the molecule consisting of (1) a mixture of organic compounds containing more than one epoxide group in the molecule, said mixture containing from 66⅔% to 100% of solid triglycidyl isocyanurate and (2) an amine epoxide resin hardener prereaction product of (a) crystalline triglycidyl isocyanurate and (b) an amine, in such a proportion that from 5% to 30% of the amine groups of said amine are reacted with the epoxide groups of said crystalline triglycidyl isocyanurate. The invention also relates to the hardened epoxide resin produced by heating said hardenable molding material.

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3,655,625

**POLYURETHANE-CINNAMATE PHOTOPOLYMER**

**Daniel C. Thomas, Covina, Calif., assignor to Lithoplate, Inc., Covina, Calif.**

**No Drawing. Filed July 28, 1969, Ser. No. 845,548**

**Int. Cl. C08g *27/04***

**U.S. Cl. 260—77.5 AM** **5 Claims**

A blocked polyurethane resin, isocyanate terminated, with isocyanate groups treated with phenol, and then heated to drive off the phenol and reacted with a polyol, is reacted with a cinnamoylating agent to make a polyurethane cinnamate which is a photopolymer.

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3,655,626

**INTERPOLYCARBONATES FROM 9,10 - BIS (HYDROXYMETHYL) - S - OCTAHYDROANTHRACENE-BIS (ALKYL OR ARYL CARBONATES)**

**Marjan Kolobielski, Baltimore, Md., assignor to United States Steel Corporation**

**No Drawing. Filed Oct. 2, 1968, Ser. No. 764,637**

**Int. Cl. C08g *17/13***

**U.S. Cl. 260—77.5** **5 Claims**

Linear, highly polymeric interpolycarbonates of 9,10-bis (hydroxymethyl-s-octahydroanthracene-bis (alkyl or aryl carbonate) copolymerized with a bis (carbonate) of a polyoxyethylene glycol of s-octahydroanthracene or with a bis (carbonate) of an aliphatic glycol. The interpolycarbonates melt between about 200° and 300° C. and can be fabricated into fibers, extrusions or molded articles by ordinary commercial means.

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3,655,627

**PROCESS FOR PREPARING SOLID PARTICLES OF UREA-URETHANE POLYMERS**

**George J. Hutzler, Williamsville, and Basil S. Farah, Elma, N.Y., assignors to Textron Inc.**

**No Drawing. Filed June 19, 1969, Ser. No. 834,859**

**Int. Cl. C08g *22/04***

**U.S. Cl. 260—77.5 AA** **27 Claims**

Urethane prepolymer compositions made from diisocyanates and polyols are reacted in an aqueous medium with primary diamines, e.g., 1-amino-3-aminomethyl-3,5,5-trimethyl cyclohexane, to give solid, particulate urea-urethanes which can be formed as films such as coatings on a substrate or as independent sheets, or the urea-urethanes can be formed as materials of greater thickness or as fibers. The products exhibit good strength and elastomeric characteristics and other desirable properties, and especially when made from aliphatic polyols, aliphatic diisocyanates and aliphatic diamines, the products have high resistance to the discoloring effects of ultra-violet light. The polyol of the composition can, for example, have as its major component aliphatic polyol. The glycols, especially the polyether glycols, are suitable polyol reactants. A variety of diisocyanates can be employed and can be aliphatic, cycloaliphatic, or aromatic.

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3,655,628

**NOVEL COPOLYMERS OF α-AMINO ACID-N-CARBOXYLIC ANHYDRIDE WITH ORGANIC ISOCYANATES AND PROCESS FOR PREPARING THE SAME**

**Shinzi Uchida, Hiroshi Nishizawa, and Yasuo Sone, Hitachi-shi, Japan, assignors to Hitachi Chemical Company Ltd., Tokyo, Japan**

**No Drawing. Filed Dec. 24, 1969, Ser. No. 888,028**

**Claims priority, application Japan, Dec. 27, 1968, 44/95,479**

**Int. Cl. C08g *22/00***

**U.S. Cl. 260—77.5 CA** **10 Claims**

Novel polypeptide-polyurea copolymers are prepared by dissolving an α-amino acid-N-carboxylic anhydride and an organic isocyanate in an organic solvent, adding to the resulting solution an organic amine as a reaction initiator and then reacting the resulting mixture at room temperature or an elevated temperature, preferably at a temperature within the range of room temperature to 70° C.

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3,655,629

**POLYCONDENSED ACID COMPOSITION AND PRODUCTION THEREOF**

**Masaki Takahara, 13 Sakurano-cho, 6-chome, Toyonaka-shi, Osaka-fu, Japan**

**No Drawing. Filed Jan. 14, 1970, Ser. No. 2,966**

**Int. Cl. C08f *3/60, 3/70, 3/80***

**U.S. Cl. 260—78.4 D** **11 Claims**

A polycondensed acid composition soluble in alkali solution and having an acid value of 30 to 250 and a softening point of 0 to 150° C., which is obtained by polycondensing an olefinic hydrocarbon (having a boiling point ranging from 20 to 300° C. and being abundant in hydrocarbons of 5 to 11 carbon atoms) with an unsaturated carboxylic acid or its anhydride in the presence of a radical catalyst together with a dehydrating catalyst at 20 to 180° C. The resultant resinous product is useful as a paper sizing agent, an emulsifier for polymerization in synthetic rubber production, a resin for paint and printing ink, etc.

3,655,630
**HIGH STRENGTH CRYSTALLINE ORIENTED FILAMENTS**
**Joseph Zimmerman, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**
**No Drawing. Continuation-in-part of application Ser. No. 693,725, Dec. 27, 1967. This application June 16, 1969, Ser. No. 833,768**
**Int. Cl. B29c** *17/02;* **C08g** *20/00*
**U.S. Cl. 260—78** **10 Claims**
This invention relates to polyamide filaments having a new crystal structure, whereby yarns of high tenacity and high thermal stability are produced.

3,655,631
**POLYMERISATION PROCESS**
**James R. Fraser, Luton, and Victor F. Jenkins, St. Albans, England, assignors to Laporte Industries Limited, London, England**
**No Drawing. Filed Nov. 17, 1969, Ser. No. 877,525**
**Claims priority, application Great Britain, Nov. 20, 1968, 55,163/68**
**Int. Cl. C08g** *17/017*
**U.S. Cl. 260—78.3 R** **13 Claims**
Delta, epsilon, and zeta lactones are polymerized in the presence of strong organic acids such as halogen activated carboxylic acids or sulfonic acids as catalyst and compounds of the formula L—$CH_2OH$ as initiator wherein L contains ethylenic unsaturation activated by amide or ester linkages. The resulting terminally unsaturated polylactones are suitable for copolymerization with ethylenically unsaturated monomers.

3,655,632
**PROCESS FOR THE PRODUCTION OF AROMATIC POLYBENZIMIDAZOLES**
**Yoshio Ohfuji, Kuraschiki, and Tamotsu Eguchi, Okayama, Japan, assignors to Kuraray Co., Ltd., Kuraschiki, Japan**
**No Drawing. Filed Sept. 15, 1970, Ser. No. 72,537**
**Int. Cl. C08g** *33/02*
**U.S. Cl. 260—78.4 N** **10 Claims**
A high molecular weight aromatic polybenzimidazole can be readily obtained by heating a mixture of an aromatic tetramine and an aromatic dinitrile in the presence of an ammonium salt of an inorganic acid or an organic sulfonic acid.

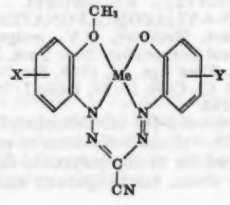
3,655,633
**METHOD OF SILYLATING ORGANIC VINYLIC POLYMERS**
**John C. Saam, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.**
**No Drawing. Filed Aug. 25, 1970, Ser. No. 66,894**
**Int. Cl. C08g** *23/00*
**U.S. Cl. 260—79** **10 Claims**
Polymerizing organic vinylic monomers by means of free radical initiation in the presence of organosilicon compounds having a chain transfer constant greater than $10^{-3}$ is a useful method for silylating organic vinylic polymers.

3,655,634
**THIIRANE COPOLYMERS**
**Bernard Boucheron, Bethune, Paris, France, assignor to Societe Ethylene Plastique, Paris, France**
**No Drawing. Filed Sept. 8, 1970, Ser. No. 70,575**
**Claims priority, application France, Sept. 16, 1969, 6931476**
**Int. Cl. C08g** *23/00*
**U.S. Cl. 260—79** **9 Claims**
Novel thermo-stable copolymers of thiirane are disclosed, these being statistical or sequential copolymers of thiirane and N,N′-methylene-bis-acrylamide containing from 0.1 to 5 mole percent of units derived from N,N′-methylene-bis-acrylamide. They are obtained by polymerisation in a medium containing a polar aprotic solvent and an alkali metal or alkali metal derivative as initiator.

3,655,635
**TALL OIL ROSIN OF LOW SULFUR CONTENT**
**Thomas F. Sanderson, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.**
**No Drawing. Filed Jan. 28, 1969, Ser. No. 794,762**
**Int. Cl. C09f** *1/02*
**U.S. Cl. 260—97.7** **6 Claims**
Disclosed is a process for removing sulfur compound impurities from tall oil rosin by dissolving tall oil rosin in a solvent followed by crystallization of the rosin component of the resulting solution.

3,655,636
**PROCESS FOR THE SYNTHESIS OF PEPTIDES USING 4-PYRIDYLMETHYL AND RELATED GROUPS FOR THE PROTECTION OF C-TERMINAL CARBOXYL GROUPS**
**Geoffrey Tyndale Young, Oxford, England, assignor to National Research Development Corporation, London, England**
**No Drawing. Filed Sept. 3, 1968, Ser. No. 757,119**
**Claims priority, application Great Britain, Sept. 4, 1967, 40,286/67; Apr. 10, 1968, 17,321/68**
**Int. Cl. C07c** *103/52, 31/32, 31/34*
**U.S. Cl. 260—112.5** **12 Claims**
In peptide synthesis peptides are purified by transferring them from the phase in which they have been prepared to a second phase, separated from impurity which remains in the first phase, and transferred back to a liquid phase to give a solution of purified peptide for a further coupling step if necessary. The peptide may be purified by binding it to an ion exchanger in a solid second phase or by taking it into a liquid second phase by solvent extraction. This purification uses novel peptide esters in which the ester protecting a terminal carboxyl contains a basic group, the preferred protecting group being 4-pyridylmethyl, which is stable to hydrogen bromide in acetic acid and to trifluoroacetic acid but which may be removed by hydrogenation, or treatment with aqueous alkali or ammonia or hydrazine. Using the 4-pyridylmethyl protecting group, amino acids and peptides are coupled in homogeneous solution in the conventional manner and examples describe the preparation of di-, tri- and tetra-peptides in which the product is insolubilized on SE-Sephadex after each coupling, and of an octapeptide, 1-L-(α)-aspartic acid-5-L-valine antiotensin II, in which the product is purified by transfer to aqueous citric acid after each coupling.

3,655,637
**METAL COMPLEX DISPERSE FORMAZANE DYES FOR POLYAMIDE**
**Karl Heinz Lohmann, Toms River, N.J., assignor to Toms River Chemical Corporation, Toms River, N.J.**
**No Drawing. Filed Feb. 24, 1969, Ser. No. 801,807**
**Int. Cl. C09b** *45/00;* **D06p** *1/18, 3/26*
**U.S. Cl. 260—149** **12 Claims**
Compounds of the formula



wherein Me is copper or nickel, and X and Y are individually hydrogen, halogen such as chlorine or bromine, lower alkyl such as methyl, ethyl, propyl and butyl, lower alkoxy such as methoxy, ethoxy, propoxy or butoxy, nitro, acetamino, sulfamoyl or lower alkyl sulfonyl provide blue and violet dyeings of very good fastness and dyeing properties, particularly light and atmospheric fading fastness and excellent leveling characteristics on synthetic polyamide fibers. These dyes can also be applied on polyester and polyester blend fabrics by padding a dispersion of the dye, drying and subjecting the padded fabrics to dry heat, e.g., 210° C. for 60 seconds.

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**3,655,638**

## AZO DYESTUFFS CONTAINING TRIAZINES AND VATTABLE POLYCYCLIC QUINONES

**Paul Ulrich, Basel, and Christoph Frey, Oberwil, Basel-Land, Switzerland, assignors to Ciba Geigy AG, Basel, Switzerland**

**No Drawing. Filed Feb. 3, 1969, Ser. No. 796,169**
**Claims priority, application Switzerland, Feb. 8, 1968, 1,860/68; Dec. 13, 1968, 18,662/68**
**Int. Cl. C09b *62/08***
**U.S. Cl. 260—153** **11 Claims**

Dyestuffs wherein a six-membered heterocyclic ring containing three nitrogen atoms as ring members is bound to two vattable chromophores free from sulphonic acid groups to each through an —NH— bridge, and through an —O— or —NH— bridge to a non-metallizable azo dyestuff residue, are valuable vat dyestuffs with excellent properties of wet fastness and surprising properties in respect of application.

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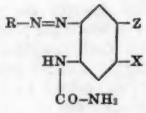
**3,655,639**

## MONOAZO DYESTUFFS CONTAINING AN ALKOXY TRIAZINE

**Henri Riat, Arlesheim, and Fritz Oesterlein, Basel, Switzerland, assignors to Ciba Geigy AG, Basel, Switzerland**

**No Drawing. Filed May 13, 1969, Ser. No. 824,315**
**Claims priority, application Switzerland, May 17, 1968, 7,296/68**
**Int. Cl. C09b *62/08***
**U.S. Cl. 260—153** **11 Claims**

Monoazo dyestuffs of the formula



in which R represents a trisulphonic acid naphthyl-(2) residue, Z represents a hydrogen atom or a low-molecular alkyl or alkoxy group and X represents the residue of a 4-chloro- (or-bromo) - 2 - alkoxy - 1,3,5-triazine bound through an —NH— bridge.

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**3,655,640**

## WATER SOLUBLE LITHIUM-N-BENZOYL-2-[[1-(DICHLOROPHENYL) - 3 - METHYL - 5 - OXO-2-PYRAZOLIN-4-YL]AZO]SULFONATES

**Robert C. Hoare, Hamburg, N.Y., assignor to Allied Chemical Corporation, New York, N.Y.**

**No Drawing. Filed Apr. 23, 1969, Ser. No. 818,821**
**Int. Cl. C09b *29/38*; D06p *1/06***
**U.S. Cl. 260—162** **2 Claims**

Lithium-N-benzoyl-2-[[1-(dichlorophenyl)-3 - methyl-5-oxo-2-pyrazolin-4-yl]azo]sulfanilates of excellent water solubility adapted for dyeing polyamide fibers in bright greenish yellow shades, fast to light and washing.

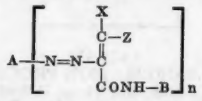
**3,655,641**

## UNSYMMETRICAL DISAZO PIGMENTS DERIVED FROM DICHLOROBENZIDINE AND ACETYLARYLAMIDES

**Alexander Hamilton, Glasgow, Scotland, assignor to Ciba-Geigy AG, Basel, Switzerland**

**No Drawing. Filed June 5, 1969, Ser. No. 830,856**
**Claims priority, application Great Britain, June 5, 1968, 26,671/68**
**Int. Cl. C09b *43/00*; C09d *11/00***
**U.S. Cl. 260—176** **6 Claims**

Colourants suitable for use, e.g. in gravure inks, are azo compounds of the formula

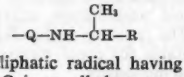


(I)

wherein A represents an unsubstituted or substituted aryl residue; B represents an unsubstituted or substituted aryl residue; X represents an alkyl group having from 1 to 4 carbon atoms or a phenyl group; *n* represents 1 or 2; and when *n* is 1, Z represents —NH—Y, wherein Y represents either a group having the formula:

(II)

or the group:



(III)

wherein R is an aliphatic radical having from 5 to 18 carbon atoms and Q is an alkylene group having up to 5 carbon atoms, and when *n* is 2 either each Z represents the group —NH—Y or one Z represents —NH—Y and the other Z is —OH, Y being as defined hereinbefore. The colourants possess greater colour value than those known products obtained by heating together certain azoacylacetarylamides and primary aliphatic amines.

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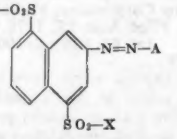
**3,655,642**

## WATER-SOLUBLE MONOAZO DYESTUFFS CONTAINING A NAPHTHALENE DIAZO COMPONENT

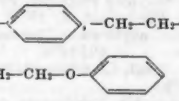
**Fritz Meininger, Frankfurt am Main, and Klaus Hunger, Kelkheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany**

**No Drawing. Filed Aug. 19, 1969, Ser. No. 851,431**
**Claims priority, application Germany, Aug. 24, 1968, P 17 93 275.1**
**Int. Cl. C09b *29/16***
**U.S. Cl. 260—194** **8 Claims**

A water-soluble monoazo dyestuff having in form of the free acid the formula



wherein X represents —CH=CH$_2$, —CH$_2$—CH$_2$—OH, —CH$_2$—CH$_2$—O—SO$_3$H, —CH$_2$—CH$_2$—S—SO$_3$H —CH$_2$—CH$_2$—O—PO$_3$H$_2$, —CH$_2$—CH$_2$—Cl —CH$_2$—CH$_2$—Br, —CH$_2$—CH$_2$—O—SO$_2$—CH$_3$



or —CH$_2$—CH$_2$—N(lower alkyl)$_2$, and A represents as a radical of a coupling component hydroxyphenylene, hy-

droxyphenylene substituted by lower alkyl, lower alkoxy or sulfo; hydroxynaphthylene, hydroxynaphthylene substituted by lower alkyl, lower alkoxy, sulfo, acetoacetylamino, benzoylamino, acryloylamino, 2,6-dichloro-s-triazinylamino, 2-chloro-6-amino-s-triazinylamino, 2,6-dihydroxy-s-triazinylamino, sulfoacetylamino or N-acetyl-N-methylamino; aminonaphthylene, aminonaphthylene substituted by sulfo or hydroxyl; 2-hydroxy-3-naphthoic acid anilide, 2-hydroxy-3-naphthoic acid anilide substituted on the benzene nucleus of the anilide radical by lower alkyl, lower alkoxy or chlorine or bromine; 2-hydroxy-3-naphthoic acid naphthylide, 2-hydroxy-3-naphthoic acid naphthylide substituted on the naphthalene nucleus of the naphthylide radicals by lower alkyl, lower alkoxy or chlorine or bromine; 1-phenyl-5-pyrazolone being substituted in the 3-position by lower alkyl, lower alkoxy, carb-lower alkoxy, carboxyl or carbamyl; 1-phenyl-5-pyrazolone being substituted in the 3-position by lower alkyl, lower alkoxy, carb-lower alkoxy, carboxyl or carbamyl and on the phenyl ring by chlorine, bromine or sulfo, 1-naphthyl-5-pyrazolone being substituted in the 3-position by lower alkyl, lower alkoxy, carb-lower alkoxy, carboxyl or carbamyl; 1-naphthyl-5-pyrazolone being substituted in the 3-position by lower alkyl, lower alkoxy, carb-lower alkoxy, carboxyl or carbamyl and on the naphthyl ring by chlorine, bromine or sulfo; said dyestuffs which have a high tinctorial strength being suitable for the dyeing or printing of fibrous materials consisting of wool, silk, polyamide fibres and native or regenerated cellulose fibres, the dyeings and prints obtained on said materials being distinguished by clear shades, good stability towards alkaline agents and dry cleaning, high degree of fixation and good to very good fastness properties to wetting and to light.

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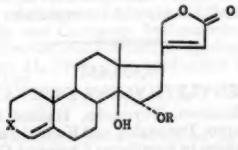
**3,655,643**

## 14β-HYDROXY-15α-ACYLOXY-CARDENOLIDES

**Hans-Gunter Lehmann, Georg Zollner, and Rudolf Wiechert, Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany**

**No Drawing. Filed July 27, 1970, Ser. No. 58,652**
**Claims priority, application Germany, July 29, 1969, P 19 39 164.1**
**Int. Cl. C07c *173/00***
**U.S. Cl. 260—210.5** **21 Claims**

14β-hydroxy-15α-acyloxy-cardenolides of the formula



wherein —OR is an esterified hydroxy group and X is >C=O or >CH—OR' in which —OR' is a free or esterified hydroxy group, tetrahydropyranyloxy group or similar readily cleavable glycoside group are cardioactive compounds which increase heart strength without reducing heart frequency.

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**3,655,644**

## DERIVATIZED STARCH THINNING WITH HYDROGEN PEROXIDE

**Harry Walter Durand, Muscatine, Iowa, assignor to Grain Processing Corporation, Muscatine, Iowa**

**No Drawing. Filed June 3, 1970, Ser. No. 43,211**
**Int. Cl. C08b *19/01***
**U.S. Cl. 260—233.3 R** **4 Claims**

Thinning of derivatized starch is accomplished with the use of hydrogen peroxide under alkaline conditions required for the derivatization.

The temperature at which thinning of derivatized starches is accomplished with the use of hydrogen peroxide is in the range of 80° to 130° F. and at a pH in the range of 7.0 to 12.0. A catalytic material such as copper ion is used in the amount of 5 parts to 100 parts per million based on the weight of starch to assist the thinning action of the hydrogen peroxide.

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**3,655,645**

## ESTERS OF ALKOXYLATED SACCHARIDES

**Pierre Jacques, Tienen, Belgium, assignor to Raffinerie Tirlemontoise, Brussels, Belgium**

**No Drawing. Filed Nov. 28, 1967, Ser. No. 686,294**
**Claims priority, application Luxembourg, Dec. 2, 1966, 52,504; Nov. 17, 1967, 52,904**
**Int. Cl. C07c *69/32***
**U.S. Cl. 260—234 R** **10 Claims**

A process for the preparation of organic compositions comprising reacting simultaneously: one or more organic substances having one or more functional groups with a shiftable hydrogen, such as a saccharide; one or more organic substances with acid character and/or mineral salts or anhydrides thereof, such as a fatty acid or a fatty acid salt; and one or more oxyalkylation substances, such as an alkylene oxide or an alkylene imine, with or without a solvent is disclosed herein. The compositions prepared are useful, as for example, as a detergent.

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**3,655,646**

## TRIHALOTHIONOACETAMIDES

**Lowell R. Smith, St. Louis, and Angelo John Speziale, Creve Coeur, Mo., assignors to Monsanto Company, St. Louis, Mo.**

**No Drawing. Original application July 22, 1963, Ser. No. 296,427, now Patent No. 3,373,200, dated Mar. 12, 1968. Divided and this application Apr. 18, 1967, Ser. No. 631,594**
**Int. Cl. C07d *27/04, 29/36, 41/04***
**U.S. Cl. 260—239 B** **2 Claims**

Compounds of the class of trihalothionoacetamides useful for the inhibition of the germination and preemergent growth of grasses.

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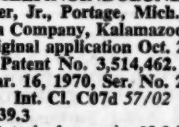
**3,655,647**

## AZEPINOINDOLONES

**Jackson B. Hester, Jr., Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**

**No Drawing. Original application Oct. 21, 1966, Ser. No. 588,288, now Patent No. 3,514,462. Divided and this application Mar. 16, 1970, Ser. No. 24,461**
**Int. Cl. C07d *57/02***
**U.S. Cl. 260—239.3** **2 Claims**

A 3,4,5,10 - tetrahydroazepino[2,3-b]indol - 1(2H)-one represented by the formula



wherein R is a member of the group consisting of hydrogen, alkyl, alkoxy, and halo radicals, wherein the alkyl and alkoxy radicals contain from 1 to 3 carbon atoms, inclusive. Useful intermediate for preparation of pharmacologically active compounds.

3,655,648

## 2,5-BENZODIAZONIN-3-ONES

William J. Houlihan and Robert E. Manning, Mountain Lakes, N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Original application Mar. 17, 1967, Ser. No. 623,850, now Patent No. 3,551,411, dated Dec. 29, 1970. Divided and this application July 7, 1970, Ser. No. 52,991

Int. Cl. C07d *53/00, 57/04*

U.S. Cl. 260—239.3 B 2 Claims

This invention relates to nitrogeneous heterocyclic compounds which are useful as anti-depressants. The compounds are of three classes, i.e. (A) 4-loweralkyl-2-oxo-1,2,3,5,6,10b-hexahydroimidazo[2,1-a]isoquinolinium halides, e.g. 8,9-dimethoxy-4-methyl - 1,2,3,5,6,10b-hexahydroimidazo]2,1-a]isoquinolinium iodide; (B) 5-loweralkyl-2,5-benzodiazonin - 3 - ones, e.g. 9,10-dimethoxy-5-methyl-2,5-benzodiazonin-3-one; and (C) 5-loweralkyl-2,5-diazonines, e.g. 9,10 - dimethoxy-5-methyl-2,5-benzodiazonine bimaleate. Compounds (A) may be obtained by treating a 1,2,3,5,6,10b-hexahydroimidazo[2,1-a]isoquinolin-2-one with a lower alkyl halide, e.g. methyl iodide. Compounds (B) may be obtained by reducing compounds (A) with sodium in liquid ammonia. Compounds (C) may be obtained by reducing compounds (B) with lithium aluminum hydride.

3,655,649

## PROCESS FOR THE PREPARATION OF 19-NORSTEROIDS

Gerhard Habermehl, Seligenstadt, and Arthur Haaf, Ober-Ramstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

No Drawing. Filed Oct. 22, 1969, Ser. No. 868,570

Claims priority, application Germany, Oct. 25, 1968, P 18 05 236.3

Int. Cl. C07c *169/10, 169/34*

U.S. Cl. 260—239.5 14 Claims

Pharmacologically and chemically useful 19-nor-3-keto-$\Delta^4$-steroids, e.g. norethisterone, are prepared by reacting a 19-hydroxy-3-keto-$\Delta^4$-steroid with a secondary amine to form the corresponding 19-nor-3,5-diene-3-amine. The latter is then hydrolyzed in a conventional manner with optionally additional steroid reactions being conducted subsequently or simultaneously.

3,655,650

## PROCESSES FOR THE PREPARATION OF 5β-H-6-KETO STEROIDS

Andor Fürst and André Furlenmeiter, Basel, Albert Langemann, Binningen, and Guy Waldvogel, Riehen, Switzerland, and Peter Hocks, Ulrich Kerb, and Rudolf Wiechert, Berlin, Germany, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Original application Feb. 29, 1968, Ser. No. 709,238. Divided and this application June 1, 1970, Ser. No. 42,595

Claims priority, application Switzerland, Aug. 13, 1965, 11,430/65; Oct. 8, 1965, 13,907/65; Jan. 28, 1966, 1,231/66; Mar. 24, 1966, 4,336/66; Germany, Sept. 24, 1965, Sch 37,774; Oct. 15, 1965, Sch 37,892; Jan. 27, 1966, Sch 38,384; Jan. 29, 1966, Sch 38,399

Int. Cl. C07c *167/16, 173/00*

U.S. Cl. 260—239.55 5 Claims

This invention is directed to processes for the synthesis of 2,3-substituted-5β-H-6-keto-steroids which are useful as metamorphosis hormones and are additionally useful as intermediates for the production of other insect hormones.

3,655,651

## 2-METHYL - 5-PHENYL-1,2-DIHYDRO-3H-2-BENZAZEPINE OR A SALT THEREOF AND PROCESS FOR PREPARING SAME

David N. Harcourt and James R. Brooks, Bath, England, assignors to Allen & Hamburys Limited, London, England

No Drawing. Filed Mar. 5, 1970, Ser. No. 16,960

Claims priority, application Great Britain, July 17, 1969, 36,027/69

Int. Cl. C07d *41/08*

U.S. Cl. 260—239 BB 6 Claims

The compound 2 - methyl-5-phenyl-1,2-dihydro-3H-2-benzazepine and salts thereof are provided as well as a process for their production by the cyclization of 3-(N-benzylmethylamino)-1-phenyl-prop - 1 - yne. The compound has a sedative-hypnotic effect.

3,655,652

## AROMATICALLY-UNSATURATED 9α-METHYL STEROIDS

Robert V. Coombs, Summit, and Eugene E. Galantay, Morristown, N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Filed July 23, 1969, Ser. No. 844,183

Int. Cl. C07c *173/00*

U.S. Cl. 260—239.55 C 11 Claims

The compounds are 13-(lower)alkyl-9α-methyl-gona-1,3,5(10)-trienes which may be substituted at the 3 and 17 positions, e.g., 3 - methoxy-9α-methylestra-1,3,5(10)-trien-17-one. The compounds are useful as pharmaceuticals.

3,655,653

## PROCESS FOR PRODUCING 4,6-DIHALOPREGNA-4,6-DIENE

Richard Wightman Kierstead and Perry Rosen, North Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed Dec. 11, 1969, Ser. No. 884,323

Int. Cl. C07c *173/00*

U.S. Cl. 260—239.55 25 Claims

A process for producing 4,6 - dichloro - 16 - alkylidene pregna - 4,6 - diene - 3,20 - diones useful as progestational agents from 3-lower alkanoyloxy-17-hydroxy-16-alkylidene-pregn-5-en-20-ones, and intermediates therein.

3,655,654

## DIPHENYLETHYLENE DERIVATIVES

Shigeyoshi Kitamura, Toyonaka, Hajime Hirai, Minoo, Yositosi Okuno, Toyonaka, and Keimei Fujimoto, Kobe, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

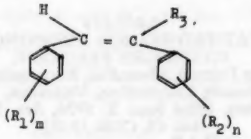
No Drawing. Filed Mar. 10, 1970, Ser. No. 18,349

Claims priority, application Japan, Mar. 28, 1969, 44/24,230; Apr. 10, 1969, 44/27,918

Int. Cl. C07d *13/10*

U.S. Cl. 260—240 D 5 Claims

1,2-diphenylethylene derivatives represented by the formula,




wherein $R_1$ and $R_2$ are respectively hydrogen, an alkyl, an alkoxy, methylenedioxy group bonded to two carbon

atoms adjacent to each other on the benzene ring, or a halogen, $R_3$ is a group of —COOR or —$CH_2$OR in which R is propargyl or allyl, and *m* and *n* are an integer of 1 to 5, and when *m* and/or *n* are an integer of 2 or more, the $R_1$'s and/or $R_2$'s may be the same or different.

The 1,2-diphenylethylene derivatives may be useful as synergists.

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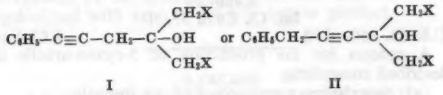
**3,655,655**

## PROCESS OF PREPARING 5-BENZYL-3-FURANMETHANOL AND INTERMEDIATES THEREFOR

**Gino R. Treves, Princeton, Pa., assignor to FMC Corporation, New York, N.Y.**

**No Drawing. Filed Oct. 31, 1969, Ser. No. 875,603**
**Int. Cl. C07d** *5/20*
**U.S. Cl. 260—240 D** **12 Claims**

5-benzyl-3-furanmethanol, a useful intermediate for producing insecticides of low mammalian toxicity, is prepared by heating at about 100° C. and in the presence of a hydrolyzing agent an acetylene compound of the formulae:

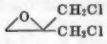


I II

wherein X is —OH or a group hydrolyzable to —OH. Where X is chlorine, I is derived by reacting

$$C_6H_5C{\equiv}C{-}M$$

with



while II is derived from $C_6H_5CH_2C{\equiv}CM$ and CO(CHX) where M represents an alkali metal or Mg halide.

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**3,655,656**

## CRYSTALLINE CEPHALEXIN MONOHYDRATE

**Earle M. Van Heyningen, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.**

**No Drawing. Continuation-in-part of application Ser. No. 818,138, Apr. 21, 1969. This application June 4, 1970, Ser. No. 43,597**
**Int. Cl. C07d** *99/24*
**U.S. Cl. 260—243 C** **2 Claims**

Cephalexin monohydrate is obtained as dense, large crystals, useful in formulations of the antibiotic, by precipitating cephalexin from an aqueous solution of its salt at a temperature above about 60° C. or by spraying anhydrous cephalexin with excess water and drying to constant weight.

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**3,655,657**

## 2,1,4-BENZOTHIADIAZINE-3-CARBAMIC ACID ESTERS

**John B. Adams, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**No Drawing. Continuation-in-part of application Ser. No. 14,212, Feb. 24, 1970. This application Oct. 20, 1970, Ser. No. 82,529**
**Int. Cl. C07d** *93/30*
**U.S. Cl. 260—243 R** **8 Claims**

A group of substituted 1H-2,1,4-benzothiadiazine-3-carbamic acid esters are useful for controlling fungi and mites. These compounds can be prepared by the reaction of an o-nitroaniline with an alkoxycarbonyl isothiocyanate followed by the alkaline hydrosulfite reduction of the intermediate formed.

A compound exemplary of the group is 1H-2,1,4-benzothiadiazine-3-carbamic acid, methyl ester.

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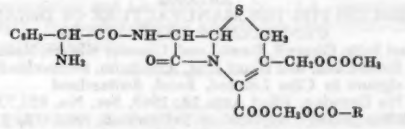
**3,655,658**

## 7(α-AMINO-α-PHENYLACETAMIDO)-CEPHALOSPORANATE ESTERS

**Wagn Ole Godtfredsen, Vaerlose, Denmark, assignor to Lovens Kemiske Fabrik Produktionsaktieselskab, Ballerup, Denmark**

**No Drawing. Filed Jan. 28, 1969, Ser. No. 794,751**
**Claims priority, application Great Britain, Jan. 30, 1968, 4,821/68**
**Int. Cl. C07d** *99/24*
**U.S. Cl. 260—243 C** **6 Claims**

The invention relates to new cephalosporanic acid esters of the formula



and their salts with non-toxic, pharmaceutically acceptable acids, R is said formula representing hydrogen, an alkyl group, a cycloalkyl group, a cycloalkyl-alkyl group, or an aralkyl group, to methods of producing the said compounds, and to pharmaceutical preparations containing the said compounds as active ingredients.

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**3,655,659**

## 3-THIADIAZOLYLTETRAHYDRO-1,3,5-OXADIAZIN-4-ONES

**Patrick R. Driscoll, Spotswood, N.J., assignor to Mobil Oil Corporation**

**No Drawing. Filed Dec. 29, 1969, Ser. No. 888,916**
**Int. Cl. C07d** *91/62*
**U.S. Cl. 260—244 R** **6 Claims**

3-thiadiazolyltetrahydro-1,3,5-oxadiazin-4-ones form a new class of herbicides. They are effective as both preemergence and post-emergence herbicides. They are highly effective against crabgrass, Johnson grass, barnyard grass, pigweed, and turnip (representative of weedy mustards).

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**3,655,660**

## PROCESS FOR PREPARING PHTHALAZONE

**Pierre Raoul, Epinay-sur-Orge, France, assignor to Pechiney-Saint Gobain, Neuilly-sur-Seine, France**

**No Drawing. Filed Sept. 21, 1970, Ser. No. 74,221**
**Int. Cl. C07d** *51/06*
**U.S. Cl. 260—250 A** **7 Claims**

A process for preparation of phthalazone by reaction of 3-acetoxy-phthalide with hydrazine hydrate in aqueous solution.

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**3,655,661**

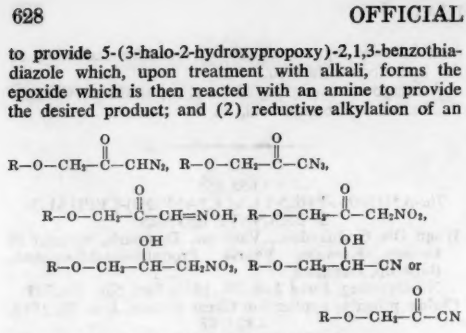
## BENZOTHIADIAZOLE COMPOUNDS

**Burton K. Wasson, Valois, Quebec, Canada, assignor to Charles E. Frosst and Co.**

**No Drawing. Filed May 22, 1968, Ser. No. 731,334**
**Int. Cl. C07d** *91/68*
**U.S. Cl. 260—247.1** **5 Claims**

5-[3-(substituted amino) - 2 - hydroxypropoxy]-2,1,3-benzothiadiazole compounds which exhibit β-adrenergic blocking properties and thus are useful in the management of angina pectoris are described. The products are prepared by one of two principal methods (1) reaction of a 5-hydroxy-2,1,3-benzothiadiazole with epihalohydrin

to provide 5-(3-halo-2-hydroxypropoxy)-2,1,3-benzothiadiazole which, upon treatment with alkali, forms the epoxide which is then reacted with an amine to provide the desired product; and (2) reductive alkylation of an



wherein R is the 2,1,3-benzothiadiazol-5-yl group.

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3,655,662

## PROCESS FOR THE MANUFACTURE OF DIHALOGENTRIAZINE DERIVATIVES

Karl Seitz, Oberwil, Basel-Land, Guenter Klahre, Reinach, Basel-Land, and Henri Riat, Arlesheim, Switzerland, assignors to Ciba Limited, Basel, Switzerland

No Drawing. Filed Aug. 20, 1969, Ser. No. 851,732
Claims priority, application Switzerland, Sept. 10, 1968, 13,510/68
Int. Cl. C07d *55/48*
U.S. Cl. 260—248 CS 7 Claims

Process for the manufacture of dihalogentriazine derivatives by condensation of cyanuric halides with alcohols in the presence of inorganic phosphates.

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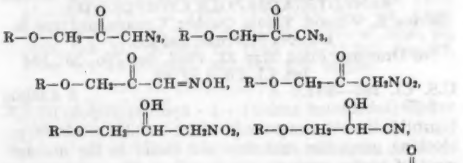
3,655,663

## 4-(3-SECONDARY AMINO-2-HYDROXY-PROXY) 1,2,5-THIADIAZOLES

Burton K. Wasson, 103 Broadview Ave., Valois, Quebec, Canada

No Drawing. Continuation-in-part of application Ser. No. 731,333, May 22, 1968. This application Apr. 21, 1969, Ser. No. 818,090
Int. Cl. C07d *87/46*
U.S. Cl. 260—247.1 26 Claims

4-[3-(substituted amino)-2-hydroxypropoxy]-1,2,5-thiadiazole compounds, optionally substituted in the 3-position of the thiadiazole nucleus which exhibit $\beta$-adrenergic blocking properties and thus are useful in the management of angina pectoris are described. The products are prepared by one of four principal methods (1) reaction of a 4-hydroxy-1,2,5-thiadiazole with epihalohydrin to provide 4-(3-halo-2-hydroxypropoxy)-1,2,5-thiadiazole which, upon treatment with alkali, forms the epoxide which is then reacted with an amine to provide the desired product; (2) reaction of a 3-chloro(or bromo)-4-(3-substituted amino-2-hydroxypropoxy)-1,2,5-thiadiazole with an amine or an N-containing heterocycle that replaces the 3-chloro group; (3) reaction of 3-carboxy-4-allyloxy-1,2,5-thiadiazole with N-bromosuccinimide followed by esterification to give the alkyl ester of 3-carboxy-4-(3-bromo-2-hydroxypropoxy)-1,2,5-thiadiazole which upon treatment with an amine forms a 3-carbamoyl-4-(3-substituted amino-2-hydroxypropoxy)-1,2,5-thiadiazole and (4) reductive alkylation of an



wherein R is the 1,2,5-thiadiazole-4-yl group.

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3,655,664

## 2-ARYL-4(3H)-QUINAZOLINONES

Richard Pater, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Dec. 12, 1968, Ser. No. 783,401
Int. Cl. C07d *51/48*
U.S. Cl. 260—251 QA 8 Claims

Process for preparing 2-phenyl-4(3H)-quinazolinone and derivatives thereof by heating a benzamide with an isatoic anhydride, which quinazolinones are useful as fluorescent agents, ultraviolet screens and the like.

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3,655,665

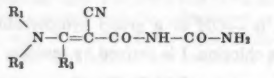
## PROCESS FOR THE PRODUCTION OF 5-CYANO-URACILS

Hubert Meindl and Hans Ackermann, Riehen, and Fred von Kaenel, Arlesheim, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Original application Apr. 4, 1966, Ser. No. 539,630, now Patent No. 3,496,214, dated Feb. 17, 1970. Divided and this application Nov. 20, 1968, Ser. No. 791,831
Claims priority, application Switzerland, Apr. 8, 1965, 4,960/65
Int. Cl. C07d *51/30*
U.S. Cl. 260—260 4 Claims

A process for the production of 5-cyano-uracils is described comprising

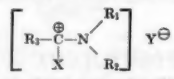
(a) ring closing a compound of the formula



(B)

in the presence of an alkaline condensing agent at a temperature of from about 30 to 150° C., or

(b) reacting a complex of the formula



with cyanacetyl urea, thereby obtaining the compound of the above Formula B and ring closing said compound with an alkaline condensing agent.

The 5-cyano-uracils obtained are valuable intermediates in the synthesis of dyestuffs.

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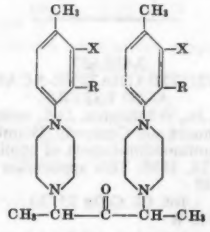
3,655,666

## 2,4-DI-(4-ARYLPIPERAZINO)-3-PENTANONES FOR TREATING SCHISTOSOMIASIS

Herschel D. Porter, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Original application Nov. 24, 1969, Ser. No. 879,631. Divided and this application Mar. 5, 1971, Ser. No. 121,543
Int. Cl. C07d *51/70*
U.S. Cl. 260—268 PH 1 Claim

2,4-di-(4-arylpiperazino)-3-pentanones represented by the formula



wherein X is halo, and R is hydrogen or methyl. The compounds of this invention are useful for the treatment of schistosomiasis.

3,655,667

## 1-(2-BENZOYLCYCLOPROPYLMETHYL)-4-PHENYLPIPERAZINES

Carl Kaiser, Haddon Heights, N.J., and Charles L. Zirkle, Berwyn, Pa., assignors to Smith Kline & French Laboratories, Philadelphia, Pa.

No Drawing. Original application Apr. 4, 1968, Ser. No. 718,915, now Patent No. 3,553,226, dated Jan. 5, 1971. Divided and this application Aug. 12, 1970, Ser. No. 63,267

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 PH 4 Claims

1-(2-benzoylcyclopropylmethyl) - 4 - phenyl-1,2,5,6-tetrahydropyridines and related 4-phenylpiperazines in which the benzoyl group and/or the phenyl moiety may be substituted by chloro, bromo, fluoro, trifluoromethyl, methyl or methoxy, as well as the ethylene ketals thereof, have tranquilizing activity. The compounds are generally prepared from a 2-benzoylcyclopropanecarboxylic acid via reaction of the triethylamine salt with ethyl chloroformate to give the mixed anhydride which is condensed with a 4-phenyl-4-piperidinol or 1-phenylpiperazine to give a corresponding amide. The ethylene ketal of the amide is reduced to the cyclopropylmethyl derivative which is hydrolyzed with acid to the free ketone product.

3,655,668

## 1,1'-METHYLENEBIS[4-(3-CHLOROPHENYL) PIPERAZINE]

Frederick J. McCarty, Dresher, Pa., assignor to Richardson-Merrell Inc., New York, N.Y.

No Drawing. Filed June 25, 1969, Ser. No. 836,615

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 PH 1 Claim

The new compound, 1,1' - methylenebis[4 - (3-chlorophenyl)piperazine], has useful analgesic, anti-inflammatory, and antipyretic properties and may be administered orally and parenterally. It is made by the reaction of Formalin on 3-chlorophenylpiperazine in an alcoholic solution.

3,655,669

## 3-CYCLIC IMIDES OF 3-AMINO-2,4,6-TRIIODOHYDROCINNAMIC ACIDS

James H. Ackerman, Bethlehem, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

No Drawing. Original application Mar. 25, 1968, Ser. No. 715,584. Divided and this application May 26, 1969, Ser. No. 827,954

Int. Cl. C07d *31/32*

U.S. Cl. 260—281 4 Claims

3-amino-2,4,6-triiodohydrocinnamic acid and α-alkyl or α-phenyl derivatives thereof react with dibasic acid anhydrides to give the corresponding 3-cyclic imides (A), which can be hydrolyzed to the corresponding anilic acids (B). The latter can be further alkylated on the nitrogen atom. Compounds A and B are useful as cholecystographic agents.

3,655,670

## 3-HYDROXY - 4 - SULFONE QUINOPHTHALONE DYESTUFFS AND PROCESS FOR MAKING THEM

Ernst Spietschka, Oberauroff, and Friedrich Ische, Kelkheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed May 19, 1969, Ser. No. 825,970
Claims priority, application Germany, May 24, 1968, P 17 69 436.9

Int. Cl. C07d *33/38*

U.S. Cl. 260—283 S 6 Claims

3-hydroxy-quinophthalone dyestuffs substituted in the 4-position by a sulfone group, and a process for preparing them. Said dyestuffs yield on synthetic fibrous materials, especially those from polyethylene terephthalates, yellow dyeings having good fastness to light, wet processing and solvents and a remarkably good fastness to thermofixation and ironing.

3,655,671

## 1,2-DISUBSTITUTED BENZO[b]QUINOLIZINES

John T. Suh, Mequon, and Richard A. Schnettler, Milwaukee, Wis., assignors to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Filed Sept. 8, 1969, Ser. No. 856,168

Int. Cl. C07d *39/00*

U.S. Cl. 260—288 R 8 Claims

The compounds are 1,2-disubstituted benzo[b]quinolizines which are useful as antihypertensive agents and central nervous system depressants. The compounds are also useful as intermediates in the preparation of pickling agents, wood perservatives and mothproofing agents. Representative of the compounds disclosed are 1-hydroxy-2-N-methylamino-1,3,4,6,11,11a - hexahydro - 2H - benzo[b]quinolizine, and 1-hydroxy - 2 - N - (3,4 - dimethoxybenzyl) - N - methylamino-1,3,4,6,11,11a - hexahydro-2H-benzo[b]quinolizine.

3,655,672

## QUINOPHTHALONE DYESTUFFS AND PROCESS FOR PREPARING THEM

Ernst Spietschka, Oberauroff, and Friedrich Ische, Kelkheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed May 19, 1969, Ser. No. 825,971
Claims priority, application Germany, May 24, 1968, P 17 69 437.0

Int. Cl. C07d *33/38*

U.S. Cl. 260—289 QP 5 Claims

3-hydroxy-quinophthalone dyestuffs substituted in the 4-position by an ether or thioether group, and a process for preparing them. Said dyestuffs yield on synthetic fibrous materials, especially those from polyethylene terephthalates, yellow dyeings having good fastness to light, wet processing and solvents and a remarkably good fastness to thermofixation and ironing.

3,655,673

## PROCESS FOR THE PREPARATION OF OXAZOLIDINONE DERIVATIVES

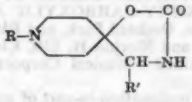
Jacques Georges Maillard, Paris, France, assignor to Laboratoires Jacques Logeais, Issy-les-Moulineauz, France

Filed Mar. 23, 1970, Ser. No. 21,646
Claims priority, application France, Mar. 25, 1969, 6908663

Int. Cl. C07d *29/30*

U.S. Cl. 260—293.66 13 Claims

This process for the preparation of 5-(piperidine-4-spiro)-oxazolidin-2-ones of formula:



in which

R is a hydrocarbon group, in particular alkyl or aralkyl, and

R' is hydrogen or a hydrocarbon group, in particular alkyl or aryl, comprises condensing a piperidone N-substituted with the R group with a nitrile of formula $CH_2R'$—CN, converting the resulting hydroxynitrile to the corresponding amide by a reaction, at least completed in alkaline medium, with hydrogen peroxide, followed by reduction of the resulting N-oxide, and effecting the ring closure of the amide into the desired oxazolidinone derivative.

## 3,655,674
## 3-[2-(4-CYCLOHEXANECARBOXAMIDO-1-PIPERIDYL)ETHYL]INDOLE

**John Leheup Archibald, Windsor, England, assignor to John Wyeth & Brother Limited, Maidenhead, England**

**No Drawing. Filed July 23, 1969, Ser. No. 844,188**
**Claims priority, application Great Britain, July 24, 1968, 35,231/68**
**Int. Cl. C07d** *29/30*
**U.S. Cl. 260—293.61** **1 Claim**

The invention relates to the field of substituted indoles, in particular to indol-3-yl-lower alkylpiperidines substituted in the piperidine ring by a cycloalkanoylamino residue, their acid addition and quaternary ammonium salts, and to intermediates and processes for the preparation thereof. The compounds of the invention are pharmacologically efficacious as hypotensive and anti-histamine agents.

## 3,655,675
## N-(N-HETERYL)-ACYLANILIDES

**Philip M. Carabateas, Schodack, N.Y., assignor to Sterling Drug Inc., New York, N.Y.**

**No Drawing. Filed Sept. 9, 1968, Ser. No. 758,924**
**Int. Cl. C07d** *29/30*
**U.S. Cl. 260—293.74** **4 Claims**

An N-[1-Z-4- (or 3)-piperidyl]acylanilide, having antidiarrheal utility, is prepared by reacting an N-[4-(or 3)-piperidyl]acylanilide with a Z-halide or by reacting a 4 (or 3)-(Q-anilino)-1-Z-piperidine with an acyl halide or anhydride, where Z is lower-alkyl, 3-cyano-3,3-diphenylpropyl or 2-cyanoethyl, acyl is propionyl, lactyl, dichloroacetyl or carbethoxy, and Q is hydrogen or $(halo)_n$ where halo is fluoro or chloro and $n$ is 1 or 2. Also included are corresponding N-[4 (or 3)-pyridyl]-, N-(3-quinuclidinyl)-, and N-(8-Z-3-nortropanyl)-acylanilides.

## 3,655,676
## 4-HYDROXY-3-HYDROXYMETHYLPHENYL-2-PIPERIDINYLCARBINOLS

**Carl Kaiser, Haddon Heights, N.J., and Stephen T. Ross, Berwyn, Pa., assignors to Smith Kline & French Laboratories, Philadelphia, Pa.**

**No Drawing. Filed Nov. 19, 1970, Ser. No. 91,222**
**Int. Cl. C07c** *29/16*
**U.S. Cl. 260—293.84** **3 Claims**

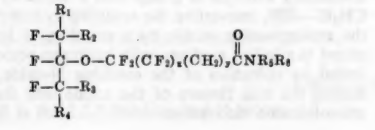
4 - hydroxy - 3 - hydroxymethylphenyl - 2 - piperidinylcarbinols prepared by the condensation of an appropriately substituted ether derivative of a methylbenzaldehyde with 2-pyridyl lithium followed by oxidation of the methyl group, removal of the ether group, and reduction of the carboxy pyridine have $\beta$-adrenergic stimulant activity. Erythro and thero diastereoisomers may be conveniently separated.

## 3,655,677
## N,N-DI-SUBSTITUTED AMIDES OF POLYFLUOROALKOXY-CARBOXYLIC ACIDS

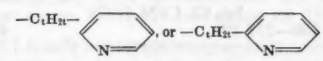
**Louis G. Anello, Orchard Park, and Richard F. Sweeney, Elma, N.Y., and Morton H. Litt, Cleveland, Ohio, assignors to Allied Chemical Corporation, New York, N.Y.**

**No Drawing. Continuation-in-part of application Ser. No. 633,359, Apr. 25, 1967. This application May 25, 1970, Ser. No. 40,433**
**Int. Cl. C07d** *31/44*
**U.S. Cl. 260—295 AM** **14 Claims**

Compounds of the formula



wherein (a) $R_1$–$R_4$ are each independently selected from the group consisting of F, Cl and perfluoroalkyl, and together can form a perfluorocycloalkylene group, with the proviso that $R_1$–$R_4$ may not contain more than two chlorine atoms, (b) $x$ is an integer of from 0–80, (c) $y$ is in integer of from 0–81, (d) $R_5$ and $R_6$ are independently selected from the group consisting of $—C_qH_{2q+1}$, $—C_tH_{2t}OH$, $—C_tH_{2t}Cl$ and, when taken together, may be



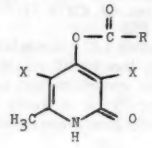
wherein $q$ is an integer from 1–24 and $t$ is an integer from 1–6; are useful as lubricants, surface active agents, and as intermediates in the sythesis of other surface active agents. The compounds described wherein $R_5$ and $R_6$ are $—C_qH_{2q+1}$ are additionally useful as insulator and condenser fluids, hydraulic fluids, and heat transfer media.

## 3,655,678
## SUBSTITUTED-2-(1H)PYRIDONES

**Chun-Shan Wang, Midland, and James P. Easterly, Bay City, Mich., assignors to The Dow Chemical Company, Midland, Mich.**

**No Drawing. Filed June 15, 1970, Ser. No. 46,474**
**Int. Cl. C07d** *31/36*
**U.S. Cl. 260—295 R** **5 Claims**

Disclosed are compounds of the formula



wherein X represents hydrogen or chlorine and R represents methyl, ethyl, phenyl, p-nitrophenyl or benzyl and the method of preparation and the use of these compounds as fungicides.

## 3,655,679
## CERTAIN ARYL PYRIDINE CARBOXYLIC ACID DERIVATIVES

**Tsung-Ying Shen, Westfield, William V. Ruyle, Scotch Plains, and Gordon L. Walford and Bruce E. Witzel, Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.**

**No Drawing. Filed June 25, 1969, Ser. No. 836,621**
**Int. Cl. C07d** *31/36*
**U.S. Cl. 260—295 R** **13 Claims**

Aryl pyridine carboxylic acids and their derivatives are described and the processes for preparing the same are disclosed. These compounds exhibit anti-inflammatory properties and also possess an effective degree of antipyretic and analgesic activity.

## 3,655,680
## METHOD FOR THE PRODUCTION OF THE (+)-OPTICAL ISOMER OF α-RACEMATE 2-(2-ETHYL-2-PHENYL-1,3-DIOXOLAN-4-YL)-PIPERIDINE

**Robert E. Allen and Charles R. Thompson, Walnut Creek, and John Hidalgo, Oakland, Calif., assignors to Cutter Laboratories, Inc.**

**No Drawing. Filed Feb. 18, 1969, Ser. No. 800,282**
**Int. Cl. C07d** *29/18*
**U.S. Cl. 260—293.67** **3 Claims**

The (+) optical isomer of the alpha racemate of 2-(2-ethyl-2-phenyl1,3-dioxolan-4-yl)-piperidine, is prepared by

the acid catalyzed condensation of the (—) optical isomer of the alpha racemate of 2-piperidyl-1,2-ethanediol hydrochloride with propiophenone dipropyl acetal, and acts as a muscle relaxant and induces general anesthesia in primates when administered parenterally.

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3,655,681

## CERTAIN 2-AMINO-3,6-BIS LOWER-ALKOXY CARBONYL - 4,5,6,7 - TETRAHYDRO THIENO[2,3-c] PYRIDINES

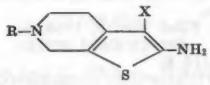
Michio Nakanishi and Tetsuya Tahara, Nakatsu, Oita, Hiroshi Imamura, Ichikawa, Chiba, and Yutaka Maruyama, Tokyo, Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

No Drawing. Original application Nov. 29, 1968, Ser. No. 780,218, now Patent No. 3,563,997, dated Feb. 16, 1971. Divided and this application Oct. 28, 1970, Ser. No. 84,876

Int. Cl. C07d *31/50*

U.S. Cl. 260—294.8 C 3 Claims

Thienopyridine derivatives of the formula



wherein R is H, acetyl, allyl, 2-propynyl, 3-chloro-2-hydroxypropyl, carboxymethyl, alkyl of 1 to 8 carbon atoms, alkoxycarbonyl wherein the alkoxy moiety contains from 1 to 4 carbon atoms, hydroxyalkyl wherein the alkyl moiety contains from 1 to 4 carbon atoms, alkoxycarbonylalkyl wherein the alkoxy and alkyl moieties each independently contains from 1 to 4 carbon atoms, phenethyl, benzyl, mono-, di- or tri-substituted benzyl or benzoyl in which the substituents are Cl, methyl or methoxy, and X is cyano, carbamoyl or alkoxycarbonyl wherein the alkoxy moiety contains from 1 to 4 carbon atoms, are analgesic and anti-inflammatory agents.

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3,655,682

## 2-AMINO-6-LOWER ALKYL OR ARALKYL-3 - CYANO-4,5,6,7-TETRAHYDRO THIENO-[2,3-c]PYRIDINE

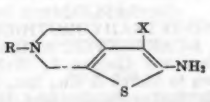
Michio Nakanishi and Tetsuya Tahara, Nakatsu, Oita, Hiroshi Imamura, Ichikawa, Chiba, and Yutaka Maruyama, Tokyo, Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

No Drawing. Original application Nov. 29, 1968, Ser. No. 780,218, now Patent No. 3,563,997, dated Feb. 16, 1971. Divided and this application Oct. 28, 1970, Ser. No. 84,877

Int. Cl. C07d *31/50*

U.S. Cl. 260—294.8 C 2 Claims

Thienopyridine derivatives of the formula



wherein R is H, acetyl, allyl, 2-propynyl, 3-chloro-2-hydroxypropyl, carboxymethyl, alkyl of 1 to 8 carbon atoms, alkoxycarbonyl wherein the alkoxy moiety contains from 1 to 4 carbon atoms, hydroxyalkyl wherein the alkyl moiety contains from 1 to 4 carbon atoms, alkoxycarbonylalkyl wherein the alkoxy and alkyl moieties each independently contains from 1 to 4 carbon atoms, phenethyl, benzyl, mono-, di- or tri-substituted benzyl or benzoyl in which the substituents are Cl, methyl or methoxy, and X is cyano, carbamoyl or alkoxycarbonyl wherein the alkoxy moiety contains from 1 to 4 carbon atoms. are analgesic and antiinflammatory agents.

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3,655,683

## ORGANOLEAD NITROGEN COMPOUNDS

Louis C. Willemsens, Croesestraat 79, Utrecht, Netherlands

No Drawing. Continuation-in-part of abandoned application Ser. No. 601,310, Dec. 13, 1966. This application Sept. 7, 1967, Ser. No. 665,979

Int. Cl. C07f *7/24*

U.S. Cl. 260—299 24 Claims

Organolead compounds in which the lead is tetravalent and is attached directly to carbon and nitrogen. Such compounds are described generally on pages 2 and 3 of the specification and are useful as anti-wear additives for lubricants. In many instances such utility is enhanced by incorporating certain anti-oxidants. A method of preparation is also described wherein the trialkyllead hydroxide is reacted with the desired heterocyclic compound in an organic solvent with formation of the desired compound and water.

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3,655,684

## NOVEL SUBSTITUTED-OXADIAZOLES AND A PROCESS FOR THE MANUFACTURE THEREOF

John Mervyn Osbond, Hatfield, and Peter George Philpott, Welwyn Garden City, England, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed Aug. 27, 1969, Ser. No. 853,510

Claims priority, application Great Britain, Sept. 19, 1968, 44,525/68

Int. Cl. C07d *85/52*

U.S. Cl. 260—307 G 8 Claims

3-[2-(R—CO—N) - ethyl] - 5 - (phenyl)-1,2,4-oxadiazoles and processes. Such compounds are useful as anticonvulsant agents.

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3,655,685

## 2-(IMIDAZOLID INYLIDENCE-(2)-AMINO)-5-NITRO-THIAZOLES AND SALTS THEREOF

Wolfgang Reuter and Eberhard Kutter, Biberach (Riss), Robert Sauter, Laupheim, and Hans Machleidt and Alexander Wildfeuer, Biberach (Riss), Germany, assignors to Boehringer Ingelheim G.m.b.H., Ingelheim (Rhine), Germany

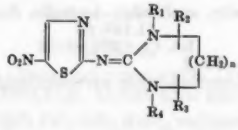
No Drawing. Filed Apr. 9, 1970, Ser. No. 27,189

Claims priority, application Germany, Apr. 9, 1969, P 19 18 070.2

Int. Cl. C07d *99/06*

U.S. Cl. 260—306.8 R 8 Claims

2 - [imidazolidinylidene - (2) - amino]-5-nitro-thiazoles of the formula



wherein

$R_1$ is hydrogen or alkyl of 1 to 3 carbon atoms,
$R_2$ is hydrogen or methyl,
$R_3$ is hydrogen or methyl,
$R_4$ is alkyl of 1 to 3 carbon atoms, and
$n$ is 0 or 1,

and non-toxic, pharmacologically acceptable acid addition salts thereof, useful as trichomonadicides in warm-blooded animals.

3,655,686
**PRODUCTION OF 3-CHLORO-1,2-BENZOISOTHIAZOLES**

Friedrich Becke, 4 Scheffelstrasse, 6900 Heidelberg, Germany, and Helmuth Hagen, 7 An der Froschlache, 6700 Ludwigshafen, Germany

No Drawing. Filed July 10, 1969, Ser. No. 840,830
Claims priority, application Germany, July 11, 1968, P 17 70 853.1
Int. Cl. C07d *91/12*
U.S. Cl. 260—304 10 Claims

Production of 3 - chloro - 1,2 - benzoisothiazoles by reaction of 1,2-benzoisothiazoles with elementary chlorine, and the new 1,2-benzoisothiazoles themselves which are chemosterilizing agents for insects and intermediates for the production of dyes and pesticides.

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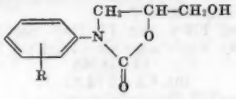
3,655,687
**DERIVATIVES OF 5-HYDROXYMETHYL-3-SUBSTITUTED-2-OXAZOLIDINONES, PROCESS OF PREPARATION THEREOF AND THERAPEUTIC APPLICATION**

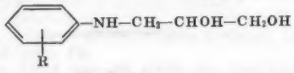
Claude P. Fauran and Guy M. Raynaud, Paris, Rene A. Oliver, Vincennes, Val de Marne, and Colette A. Douzon, Paris, France, assignors to Delalande S.A., Courbevoie, Hauts-de-Seine, France

No Drawing. Filed Mar. 16, 1970, Ser. No. 20,020
Claims priority, application Great Britain, Mar. 18, 1969, 14,260/69
Int. Cl. C07d *85/28*
U.S. Cl. 260—307 C 2 Claims

Compounds of the formula



in which R is H, Cl, F, $CH_3$ or $CF_3$. The compounds are prepared by cyclizing with ethyl carbonate, a compound of the formula



The compounds have anti-depressive, myorelaxing, tranquilizing, sedative, analgesic, anti-convulsive, anti-pyretic, anti-inflammatory and uricosuric activities.

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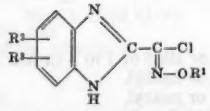
3,655,688
**N-ALKOXY-2-BENZIMIDAZOLE CARBOXIMIDOYL CHLORIDES**

George Holan, Brighton, Victoria, and Eva Lea Samuel, Bentleigh, Victoria, Australia, assignors to Monsanto Chemicals (Australia) Limited, West Footscray, Victoria, Australia

No Drawing. Original application Sept. 18, 1967, Ser. No. 668,679, now Patent No. 3,560,195, dated Feb. 2, 1971. Divided and this application May 21, 1970, Ser. No. 48,600
Claims priority, application Australia, Sept. 19, 1966, 11,199/66
Int. Cl. C07d *49/38*
U.S. Cl. 260—309.2 5 Claims

N-alkoxy-2-benzimidazole carboximidoyl chlorides of the formula:



wherein $R^1$ is alkyl of not more than six carbon atoms; and $R^2$ and $R^3$ are independently selected from the group consisting of hydrogen, chlorine, bromine, nitro, alkyl of not more than four carbon atoms and alkoxy of not more than four carbon atoms, exhibit herbicidal activity.

3,655,689
**IMIDAZOLIDINEDIONE HERBICIDES**

Malcolm Scott Singer, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Continuation-in-part of application Ser. No. 745,417, July 17, 1968. This application Aug. 22, 1969, Ser. No. 852,509
Int. Cl. C07d *49/32*
U.S. Cl. 260—309.5 4 Claims

5 - imino-imidazolidinediones and 4-thio-5-imino-imidazolidinediones in which the nitrogen in the 1 position of the imidazolidinedione nucleus is substituted with an aryl radical of 6 to 15 carbon atoms, the nitrogen in the 3 position is substituted with an aliphatic or cycloaliphatic radical and the imino group is optionally substituted with a carbamoyl or N-chloroacetylcarbamoyl radical. These imidazolidinediones are pre- and post-emergence herbicides.

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3,655,690
**1,2,3,5-TETRAMETHYL PYRAZOLIUM CHLORIDE AND METHOD FOR PREPARATION**

Charles F. Hobbs, Des Peres, and James Dennis Wilson, University City, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Nov. 8, 1968, Ser. No. 774,501
Int. Cl. C07d *49/18*
U.S. Cl. 260—310 R 2 Claims

The invention relates to the preparation of various amide type compounds including amides, amidinium salts, vinylogous amidinium salts and endiamines. The compounds are prepared from carboxyl compounds by a reaction with an amine in the presence of a metal halide. The compounds of the invention have utility in the production of various nitrogen compounds and as biologically active materials, as antioxidants and acid scavengers.

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3,655,691
**N,N'-DISUBSTITUTED CYCLOPENTANE-1,2,3,4-TETRACARBOXIMIDES**

Donald F. Page, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

No Drawing. Original application Nov. 15, 1967, Ser. No. 683,109, now Patent No. 3,551,447, dated Dec. 29, 1970. Divided and this application Mar. 30, 1970, Ser. No. 24,033
Int. Cl. C07d *27/30*
U.S. Cl. 260—326.3 2 Claims

Perhydrocyclopenta[1,2-c:3,4-c']dipyrroles and N,N'-disubstituted derivatives thereof are prepared by reacting cyclopentane-1,2,3,4-tetracarboxylic acid anhydride with a primary amine and reducing the resulting cyclopentane-1,2,3,4-tetracarboximide or N,N'-disubstituted derivative thereof with lithium aluminum hydride. The compounds are insecticides, and also affect the central nervous and cardiovascular system of mammalian species.

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3,655,692
**3-AMINO-TETRAHYDROTHIOPHENE-3-CARBOXYLIC ACIDS**

Tsung-Ying Shen and Gordon L. Walford, Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Original application Sept. 11, 1967, Ser. No. 666,922, now Patent No. 3,547,948, dated Dec. 15, 1970. Divided and this application Apr. 7, 1970, Ser. No. 23,103
Int. Cl. C07d *63/04*
U.S. Cl. 260—332.2 C 2 Claims

Processes for the preparation of novel amino acids. The compounds are 5-membered heterocyclic amino acid derivatives of teramethylene sulfide and trimethylene-1,2-disulfide. The sulfide derivatives are prepared by converting a keto tetramethylene sulfide to its corresponding amino nitrile, with subsequent hydrolysis to the amino

acid. The 1,2-disulfide derivatives are prepared via reaction of an alkyl ketone with an aralkyl mercaptan with ultimate elimination of the sulfur protecting group and oxidation to the disulfide. The novel amino acids are useful as anti-inflammatory agents.

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3,655,693

## ANTI-INFLAMMATORY SALICYCLIC ACID DERIVATIVES

Tsung-Ying Shen, Bruce E. Witzel, and Gordon L. Walford, Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed June 25, 1969, Ser. No. 836,582

Int. Cl. A61k *27/00*; C07d *63/12, 63/14*

U.S. Cl. 260—332.2 A 6 Claims

Salicylic acid derivatives and their non-toxic pharmaceutically acceptable salts, esters and amides are claimed. Also encompassed is the treatment of inflammation with said derivatives.

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3,655,694

## NOVEL α-PYRONES

Kyu Tai Lee and Joel G. Whitney, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Original application Mar. 4, 1968, Ser. No. 709,908. Divided and this application Feb. 11, 1971, Ser. No. 114,683

Int. Cl. C07d *7/18*

U.S. Cl. 260—343.2 R 3 Claims

Certain novel α-pyrones are useful intermediates in the preparation of ethanooctahydrophenanthrene derivatives, which are effective antifertility agents. The novel pyrones are made from appropriately substituted α-tetralones by reaction with ethyl ethoxymethylenecyanoacetate in glyme in the presence of sodium ethoxide under a nitrogen atmosphere.

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3,655,695

## 6-ALKYL-SUBSTITUTED TETRAHYDROPYRAN-2-OLS AND PROCESS FOR THEIR PRODUCTION

David Andrews, 24 Hillside Ave., Nutley, N.J. 07110, and Gabriel Saucy, 125 Fells Road, Essex Fells, N.J. 07021

No Drawing. Continuation-in-part of application Ser. No. 633,693, Apr. 26, 1967. This application May 21, 1969, Ser. No. 826,669

Int. Cl. C07d *13/04*

U.S. Cl. 260—340.5 24 Claims

6-substituted -tetrahydropyran-2-ols are prepared by reaction of Grignard reagents with lower alkyl-glutaraldehyde or glutaraldehyde. The products are useful intermediates in the total synthesis of steroids.

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3,655,696

## 2,3-DIHYDRO-3,3-DIMETHYL-5-BENZOFURANYL METHYLCARBAMATE

Kenneth R. Wilson, Tonawanda, and Robert M. Kennedy, Medina, N.Y., assignors to FMC Corporation, New York, N.Y.

No Drawing. Filed Feb. 6, 1970, Ser. No. 9,406

Int. Cl. C07d *5/36*

U.S. Cl. 260—346.2 1 Claim

The new pesticide 2,3-dihydro-3,3-dimethyl-5-benzofuranyl methylcarbamate is described, together with its preparation, physical properties, formulation, and use to control Arthropoda and Nematoda.

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3,655,697

## ORTHO-HYDROXYDIBENZOFURAN CARBOXYLIC ACID AND ACID DERIVATIVES SUBSTITUTED BY A HALOGEN ATOM

Tsung-Ying Shen, Bruce E. Witzel, and Gordon L. Walford, Westfield, and William V. Ruyle, Scotch Plains, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed June 25, 1969, Ser. No. 836,603

Int. Cl. C07d *5/49*

U.S. Cl. 260—346.2 3 Claims

This invention relates to new tricyclic carboxylic acid and ester derivatives and processes for their preparation. These compounds have anti-inflammatory, anti-pyretic and analgesic activity. Also included are claims for methods of treating inflammation using the carboxylic acid compounds of this invention.

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3,655,698

## EPOXIDATION OF SOYBEAN OIL

Lee H. Dierdorff, Jr., Princeton, N.J., and Joseph H. Kosciolek, Manlius, N.Y., assignors to FMC Corporation, New York, N.Y.

Continuation of application Ser. No. 328,809, Dec. 9, 1963. This application Aug. 15, 1967, Ser. No. 667,312

Int. Cl. C07d *1/10*

U.S. Cl. 260—348.5 V 1 Claim

This application discloses a method of increasing the oxygen content of oxidizable organic materials by contacting the oxidizable organic material with a vaporous effluent containing 5%, by weight, of peracetic acid coming directly from a peracetic acid generator. The method is useful in epoxidizing ethylenically unsaturated organic compounds and in bleaching liquids, textiles and wood pulp.

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3,655,699

## ANALOGUES OF LAPACHOL AS ANTITUMOR AGENTS

Herman Rutner, Hackensack, N.J., assignor to Pfizer Inc., New York, N.Y.

No Drawing. Filed Mar. 2, 1970, Ser. No. 15,849

Int. Cl. C07c *49/66*

U.S. Cl. 260—396 K 3 Claims

The preparation of certain novel analogues of lapachol and the activity of these compounds against Walker 256 carcinosarcoma in rats is disclosed.

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3,655,700

## OXYGENATED UNSATURATED ALIPHATIC CARBOXYLIC ACIDS AND ESTERS

John B. Siddall, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

No Drawing. Filed Feb. 2, 1970, Ser. No. 7,988

Int. Cl. C07c *69/66, 69/52*; A01n *9/24*

U.S. Cl. 260—405 7 Claims

Preparation of polyolefins involving photooxygenation of an isolated double bond of a polyolefin to allylic hydroperoxide which is reduced to the allylic alcohol, the allylic alcohol is converted to the allylic acylate which is alkylated using organolithium cuprate.

3,655,701

## PRODUCTION OF CARBOXYLIC ACID ESTERS BY REACTION OF SODIUM CARBOXYLATES WITH ALKYL HALIDES USING CERTAIN GLYCOLS AND ETHERS AS DILUENTS

Bernard J. Darre, Baton Rouge, La., assignor to Ethyl Corporation, New York, N.Y.

No Drawing. Filed Apr. 9, 1969, Ser. No. 814,796

Int. Cl. C07c *67/00, 67/02*

U.S. Cl. 260—410.9 R 17 Claims

A process is disclosed for producing esters in good yield and at low cost from inexpensive reactants. The process is characterized by the absence of deliberately added catalyst materials. It has been discovered that certain diluents will permit a reaction between certain inexpensive organic reactant materials without requiring the presence of a deliberately added specific catalyst material.

3,655,702

## CONTINUOUS RENDERING PROCESS

Ditlev P. Madsen, Palos Park, and John H. Pikel, Oaklawn, Ill., assignors to Chemetron Corporation, Chicago, Ill.

Filed Dec. 16, 1968, Ser. No. 784,100

Int. Cl. C11b *1/12*

U.S. Cl. 260—412.6 7 Claims

There is provided an improved method and apparatus for the continuous rendering of fatty material, wherein the material to be rendered is first passed through a known type of rendering evaporator for separating fat and cracklings from the raw material. The material is fed into a substantially airfree state. A controlled pressure is maintained in the rendering evaporator to aid in the removal of moisture. The treated material is discharged in a continuous process from the rendering evaporator through a suitable discharge outlet. An airlock is provided with the discharge outlet for preventing the entry of air into the rendering evaporator through the discharge outlet.

3,655,703

## ORGANOTIN MERCAPTOACID ESTER STABILIZERS FOR VINYL HALIDE RESIN COMPOSITIONS AND COMPOSITIONS STABILIZED THEREWITH

Samuel Hoch, Brooklyn, N.Y., assignor to Tenneco Chemicals, Inc.

No Drawing. Filed Jan. 5, 1970, Ser. No. 807

Int. Cl. C07f *7/22*; C08f *45/56*

U.S. Cl. 260—429.7 16 Claims

A stabilizer for vinyl halide resin compositions comprises an organotin compound, such as dibutyltin bis-(isooctyl thioglycolate), and a small amount of an alkyl acid phosphate. These stabilizers, unlike the untreated organotin compounds, are stable for long periods at room temperature. Their use results in vinyl halide resin compositions that have improved color and heat stability.

3,655,704

## PROCESS FOR THE PREPARATION OF ZINC ALKYL ORTHOPHOSPHATES

Paul David Sherman, Calumet City, and Frank J. Chloupek, South Holland, Ill., assignors to Atlantic Richfield Company, New York, N.Y.

No Drawing. Filed Jan. 28, 1970, Ser. No. 6,601

Int. Cl. C07f *3/06*

U.S. Cl. 260—429.9 10 Claims

An improved process for the manufacture of zinc alkyl orthophosphates is disclosed. Phosphorus pentoxide is reacted with an aliphatic alcohol containing from about 10 to 14 carbon atoms, such as tridecyl alcohol, in the presence of an aromatic solvent and the resulting orthophosphate ester is neutralized using a solid zinc salt such as zinc carbonate or zinc acetate, in amounts of at least about 50%, up to about 85%, preferably 70% to 80%, of the zinc required to fully neutralize the esters. The zinc alkyl orthophosphates are useful as additives in gasolines.

3,655,705

## ORGANOPHOSPHATO-STANNANES

Guenther Fritz Lengnick, Manitou Beach, Mich., assignor to Stauffer-Wacker Silicone Corporation

No Drawing. Original application Feb. 27, 1968, Ser. No. 708,501, now Patent No. 3,527,778. Divided and this application Apr. 23, 1970, Ser. No. 43,305

Int. Cl. C07f *7/22*

U.S. Cl. 260—429.7 6 Claims

Organophosphatostannanes and curable organopolysiloxanes containing organophosphatostannane catalysts.

3,655,706

## SYNTHESIS OF TETRAMETHYLLEAD

Robert G. Briody and Edward G. Newyear, Corpus Christi, Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

No Drawing. Filed Nov. 20, 1969, Ser. No. 878,551

Int. Cl. C07f *7/24*

U.S. Cl. 260—437 R 4 Claims

A process is described for the preparation of tetramethyllead which involves reacting methyl chloride and sodium-lead alloy together in the presence of magnesium-aluminum alloy as catalyst. The alloy is described as containing at least 20 percent by weight magnesium and the temperatures of operation are described as between 100° C. and 150° C.

3,655,707

## PREPARATION OF ORGANOMERCURY COMPOUNDS

Roy R. Josephson, West Marlborough Township, Chester County, Pa., assignor to Hercules Incorporated, Wilmington, Del.

No Drawing. Filed Oct. 10, 1969, Ser. No. 865,491

Int. Cl. C07f *3/12*

U.S. Cl. 260—433 9 Claims

Organomercury compounds are prepared by contacting a mercurating agent with an electronegatively-substituted aromatic organic compound in liquid hydrogen fluoride as the solvent. Representative of the compounds which are mercurated is nitrobenzene, which otherwise is difficult to mercurate. The reaction may be carried out at room temperature.

3,655,708

## NICKEL SALTS OF MIXED ORGANIC ANIONS

Saul Gobstein, University Heights, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

No Drawing. Continuation-in-part of application Ser. No. 736,003, June 11, 1968. This application Feb. 9, 1970, Ser. No. 9,982

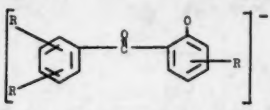
Int. Cl. C07f *15/02, 45/62*

U.S. Cl. 260—439 R 11 Claims

This invention relates to certain novel compositions of matter, and more particularly to nickel salts of mixed phenoxide anions, having particular utility as stabilizers in polyolefin polymers. The novel compositions of the present invention correspond to the general formula:

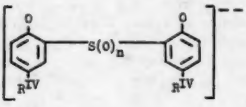
$$x\text{—Ni-}y\text{-}z$$

$x$ is a monovalent benzophenoxy anion within the scope of the formula:



wherein the respective R groups may be the same or different, and each is a member selected from the group consisting of hydrogen atoms, hydroxyl radicals, alkyl radicals having less than about 15 carbon atoms, and alkoxy radicals having less than about 15 carbon atoms;

$y$ is a bivalent bisphenol anion within the scope of the formula:



wherein $R^{IV}$ is alkyl or alkoxy, both of less than 15 carbon atoms, and $n$ is an integer having a value of 1 or 2; and

$z$ is a member selected from the group consisting of a hydrogen atom and the radical [Ni—$x$], $x$ being defined as above.

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**3,655,709**

## PROCESS FOR THE MANUFACTURE OF ARYLCHLOROSILANES IN ACCORDANCE WITH THE ROCHOW SYNTHESIS

**Ludwig Fries, Odenthal-Hahnenberg, Rudolf Mundil, Leverkusen, and Herbert Wiechers, Opladen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany**

**Filed Sept. 14, 1970, Ser. No. 72,065**

**Claims priority, application Germany, Oct. 11, 1969, P 19 51 410.4**

**Int. Cl. C07f 7/16**

**U.S. Cl. 260—448.2 T** **6 Claims**

In the manufacture of arylchlorosilanes in accordance with the Rochow synthesis by reaction of aryl halides with silicon, the reaction products leaving the reaction vessel are completely condensed, and the condensate, containing solids, is separated by means of a decanter into a liquid phase free of solids and a solid largely free of liquid, with the liquid phase being worked-up in accordance with processes which are in themselves known.

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**3,655,710**

## PROCESS FOR THE PREPARATION OF ARYLDIMETHYLCHLOROSILANES

**Andre Bazouin, Luzinay, and Marcel Lefort, Caluire, France, assignors to Rhone-Poulenc S.A., Paris, France**

**No Drawing. Filed Mar. 11, 1970, Ser. No. 18,770**

**Claims priority, application France, Mar. 13, 1969, 6907120**

**Int. Cl. C07f 7/02**

**U.S. Cl. 260—448.2 P** **8 Claims**

Aryldimethylchlorosilanes are prepared in good yield when a diaryldichlorosilane and trimethylchlorosilane are heated together in the liquid phase in the presence of aluminum chloride as a catalyst.

**3,655,711**

## PREPARATION OF CYCLIC NITROGEN-CONTAINING ORGANOSILICON COMPOUNDS

**Richard Paul Bush, Penarth, Glamorgan, and Bryan Thomas, Thomastown, Glamorgan, Wales, assignors to Midland Silicones Limited, Reading, Berkshire, England**

**No Drawing. Filed Jan. 13, 1971, Ser. No. 106,268**

**Claims priority, application Great Britain, Jan. 13, 1970, 1,611/70; May 8, 1970, 22,429/70**

**Int. Cl. C07f 7/10**

**U.S. Cl. 260—448.2 N** **6 Claims**

Process for the production of N-substituted cyclotrisilazanes which comprises reacting, preferably at a temperature below 50° C., chlorodimethylsilane and a cyclosilazane of the general formula $(R_2SiNH)_n$ in which R is a monovalent hydrocarbon radical having less than 7 carbon atoms and $n$ is 3 or 4.

The N,N¹-bis(dimethylsilyl)cyclotrisilazanes which can be prepared by the process are claimed as novel compounds.

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**3,655,712**

## EQUILIBRATED ORGANO-POLYSILOXANE MIXTURES WITH TERMINAL SULFURIC ACID GROUPS AND PROCESS FOR THEIR PREPARATION

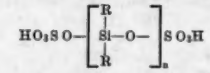
**Gerd Rossmy, Essen-Werden, Germany, assignor to Th. Goldschmidt A.G., Essen, Germany**

**No Drawing. Filed Jan. 28, 1970, Ser. No. 6,547**

**Int. Cl. C07f 7/02**

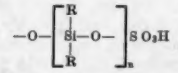
**U.S. Cl. 260—448.2 N** **60 Claims**

A linear equilibrated organo-polysiloxane mixture having terminal sulfuric acid groups of the general formula



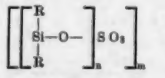
I

wherein $n$=2 to 20 and R is hydrocarbon which may be substituted by a group inert in respect to sulfuric acid. A portion of the hydrocarbon groups R may be replaced by the group



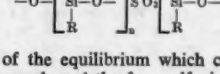
V

The application also discloses a process for the preparation of such equilibrated organo-polysiloxane mixtures which are in equilibrium with sulfuric acid and cyclic compounds of the general formula



II

wherein R and $n$ have the above meaning, $m$ being 1–10. If a portion of the R groups of Formula I is replaced by groups of Formula V, then two of the Formula V groups may form the group



IX

on that side of the equilibrium which contains the Formula II compounds and the free sulfuric acid. The novel mixtures are useful as equilibration catalysts for organopolysiloxanes. They may also successfully be employed as impregnation agents for imparting various materials such as glass, textiles, and the like with water repellent characteristics.

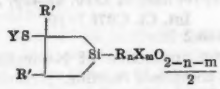
3,655,713

## SILACYCLOPENTANE THIOLS AND THIOLATES

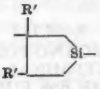
Gary E. Le Grow, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

No Drawing. Filed July 13, 1970, Ser. No. 54,582
Int. Cl. C07f 7/10, 7/18
U.S. Cl. 260—448.2 N 10 Claims

Silacyclopentane mercaptans and thiolates of the formula



in which Y is hydrogen or an acyl group, $n$ is 0 or 1, $m$ is 0 to 2, are prepared by the addition of $H_2S$ or acyl-SH to the corresponding silacyclopentene in the presence of free radical generators such as peroxides, azo-bis-nitriles or ultraviolet light. Specific compounds where Z is



are $HSZ(CH_3)Cl$, $\{CH_3COSZ(CH_3)\}_2O$ and $(HSZO)_n$. The novel compounds are useful as lubricants, lubricant additives, and chemical intermediates.

3,655,714

## PROCESS FOR PREPARING FLUORINE COMPOUNDS FROM ORGANOSILICON COMPOUNDS BY MEANS OF FLUORIDES OF THE FIRST TO THIRD MAIN GROUPS OF THE PERIODIC SYSTEM

Christian Dathe, Radebeul, Germany, assignor to Institut fur Silikon- und Fluorkarbonchemie, Radebeul, Germany

No Drawing. Filed May 20, 1969, Ser. No. 826,259
Int. Cl. C07f 7/12, 7/18
U.S. Cl. 260—448.2 E 11 Claims

A process for preparing fluorine compounds from organosilicon compounds having atoms or atom groups exchangeable with fluorine, which comprises reacting said compounds with at least a molar quantity of a difficultly soluble metal fluoride of the first to third main groups of the Periodic System of Elements at about normal temperature in the presence of an inorganic diluted acid which is stronger than hydrofluoric acid, heating the mixture to water-bath temperature, and collecting the fluorine compound escaping from the reaction mixture by condensation. The process has the advantage of dispensing with HF as fluorinating agent, thereby eliminating the use of special acid-resistant equipment and particular safety measures mandatory in operation with HF.

3,655,715

## SYNTHESIS OF N-SUBSTITUTED 2-AMINOETHANETHIOSULFURIC ACIDS

Daniel L. Klayman, Chevy Chase, Md., and W. Franklin Gilmore, Oxford, Miss., assignors to the United States of America as represented by the Secretary of the Army

No Drawing. Application June 17, 1968, Ser. No. 737,358, now Patent No. 3,595,899, dated July 27, 1971, which is a continuation-in-part of application Ser. No. 506,291, Nov. 3, 1965. Divided and this application July 15, 1969, Ser. No. 870,883
Int. Cl. C07c 141/00
U.S. Cl. 260—453 R 1 Claim

A process for the synthesis of N-substituted 2-aminoethanethiosulfuric acids of the formula:

$$R—NH—CH_2—CH_2—SSO_3H$$

wherein R represents alkyl or phenyl alkyl by reacting ammonium thiosulfate with a 1-substituted aziridine. The compounds made by this process are effective antiradiation agents for animals.

3,655,716

## CYANO CONTAINING HYDRAZONES AND METHYL SULFATE SALTS THEREOF

Willy Leimgruber, Montclair, and Manfred Weigele, North Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Original application Apr. 9, 1968, Ser. No. 719,834, now Patent No. 3,542,848, dated Nov. 24, 1970. Divided and this application June 1, 1970, Ser. No. 42,528
Int. Cl. C07c 121/42
U.S. Cl. 260—459 3 Claims

This invention is directed to a process for the preparation of aminomethylene malononitrile from dialkyl aminoacrylonitrile including intermediates therein. Aminomethylene malononitrile is a known compound which is a valuable intermediate in the synthesis of thiamine.

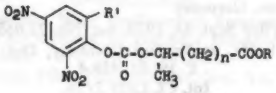
3,655,717

## NOVEL O-(2-ALKYL - 4,6-DINITRO-PHENYL)-O'-(α-CARBALKOXY-ALKYL)-CARBONATES

Heinz-Manfred Becher, Bingen (Rhine) and Richard Sehring, Ingelheim (Rhine), Germany, assignors to Boehringer Ingelheim G.m.b.H., Ingelheim am Rhine, Germany

No Drawing. Filed June 9, 1970, Ser. No. 45,274
Claims priority, application Germany, June 16, 1969, P 19 30 593.2; Dec. 5, 1969, P 19 61 210.3
Int. Cl. C07c 69/68, 69/00; A01n 9/26
U.S. Cl. 260—463 4 Claims

Compounds of the formula



wherein

R is straight or branched alkyl of 1 to 12 carbon atoms,
R' is straight or branched alkyl of 1 to 8 carbon atoms or cyclohexyl, and
$n$ is 0 or 1;

the compounds are useful as phyto-compatible acaricides.

3,655,718

## POLYCARBONATE STABILIZER COMPOSITIONS

Henry G. Schutze and Herschel C. Williams, Baytown, Tex., Norman P. Neureiter, Bethesda, Md., and Delos E. Bown, White Plains, N.Y., assignors to Esso Research and Engineering Company

No Drawing. Division of application Ser. No. 611,785, Nov. 14, 1966, now Patent No. 3,510,507, which is a division of application Ser. No. 248,876, Jan. 2, 1963. Divided and this application Jan. 7, 1970, Ser. No. 1,294
Int. Cl. C07c 69/00, 149/32; C08f 45/58
U.S. Cl. 260—463 3 Claims

Polyphosphorous condensation products, polyborate condensation products, polycarbonate condensation products and polysilicate condensation products of 4,4'-bisphenols are especially effective stabilizers for polyolefins.

3,655,719
**AMINO CARBONATE ADDUCTS AND METHOD OF MAKING SAME**
John E. Anderson and Clyde E. Parish, Houston, Tex., and George H. Ross, Phoenix, Ariz., assignors to Signal Chemical Company
No Drawing. Application Nov. 8, 1966, Ser. No. 592,749, now Patent No. 3,502,706, dated Mar. 24, 1970, which is a continuation-in-part of application Ser. No. 372,409, June 3, 1964. Divided and this application Oct. 22, 1969, Ser. No. 888,192
Int. Cl. C07c *87/00*; A61l *13/00*
U.S. Cl. 260—463 6 Claims
Carbonate adducts are prepared by reacting a tertiary amine, a lower alkanol and mixtures thereof, and carbon dioxide at a temperature below that at which decomposition of the adduct occurs.

3,655,720
**ISOPHORONE DERIVATIVES HAVING A NITRILE-CONTAINING SUBSTITUENT IN THE 4-POSITION**
John Charles Leffingwell, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.
No Drawing. Filed Feb. 3, 1969, Ser. No. 796,191
Int. Cl. C07c *121/48*
U.S. Cl. 260—464 1 Claim
Substituents are introduced into the 4-position of isophorone by reacting isopropenylacetate with isophorone to form isophorone enol acetate, then reacting with an isophorone enol acetate a dienophile to form bicyclic adducts which upon hydrolysis afford isophorone derivatives substituted in the 4-position.

3,655,721
**PROCESS FOR THE PRODUCTION OF MALONIC ACID DINITRILE AND PURIFICATION THEREOF**
Urs Arni, Brig, and Adriano Faucci and August Stocker, Visp, Switzerland, assignors to Lonza Ltd., Gampel, Valais, Switzerland
No Drawing. Filed May 7, 1969, Ser. No. 822,724
Claims priority, application Switzerland, May 9, 1968, 6,964/68; June 18, 1968, 9,059/68; June 24, 1968, 9,383/68
Int. Cl. C07c *121/22*
U.S. Cl. 260—465.8 2 Claims
Malonic acid dinitrile is prepared by reacting acetonitrile and cyanogen chloride in the gaseous phase at temperatures from 740 to 780° C. Temperatures from 750° to 760° C. with molar ratios of 1:1 to 1:5 of cyanogen chloride to acetonitrile are preferred. The crude mixture containing malonic acid dinitrile may be purified by conversion of the principal impurities to easily separable compounds by a Diels-Alder or selective hydrogenation reaction.

3,655,722
**7-METHYL-OCTADIENENITRILES**
Peter W. D. Mitchell, Atlantic Highlands, and Jack Herbert Blumenthal, Oakhurst, N.J., assignors to International Flavors & Fragrances, Inc., New York, N.Y.
No Drawing. Original application Feb. 2, 1967, Ser. No. 613,445, now Patent No. 3,553,110, dated Jan. 5, 1971. Divided and this application Jan. 26, 1970, Ser. No. 12,022
Int. Cl. C07c *121/30*
U.S. Cl. 260—465.9 3 Claims
This disclosure describes methods for the preparation and isolation of a variety of 7-methyl-2,6-octadienenitriles by condensation of cyanoacetic acid with 2-methylhept-2-ene-6-one in the presence of an amine or an acid addition salt of an amine at a temperature of from about 40° C. to 180° C. A mixture of nitriles is produced in the condensation reaction. The relative proportion of each nitrile in the mixture can be controlled by control of the alkalinity of the reaction medium. The compounds and mixtures are useful as olfactory agents.

3,655,723
**HYDROCYANATION OF OLEFINS**
William Charles Drinkard, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed Oct. 31, 1969, Ser. No. 873,063
Int. Cl. C07c *121/04*
U.S. Cl. 260—465.3 10 Claims
An improved process for hydrocyanating an unsaturated organic compound having at least one aliphatic carbon-carbon double bond in the presence of a complex of a metal such as nickel, cobalt, palladium, iron, tungsten, or molybdenum wherein a cyanohydrin is employed as the source of hydrogen cyanide.

3,655,724
**PROCESS OF DIMERIZING ACRYLONITRILE**
William Joseph Linn and Alvin Barber Stiles, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Original application July 19, 1967, Ser. No. 654,329, now Patent No. 3,562,181, dated Feb. 9, 1971. Divided and this application Aug. 27, 1969, Ser. No. 853,514
Int. Cl. C07c *121/26, 121/30*
U.S. Cl. 260—465.8 6 Claims
Acrylonitrile can be efficiently dimerized by hydrogen in the presence of a catalyst formed by the reaction of soluble ruthenium compounds with salts of weak acids and adsorbed on charcoal or $\eta$ alumina. The selected supports enhance the yield obtained.

3,655,725
**AMINOCYCLOPENTANECARBOXYLIC ACID DERIVATIVES**
Harvey E. Alburn, West Chester, and William Dvonch, Radnor, Pa., assignors to American Home Products Corporation, New York, N.Y.
No Drawing. Continuation-in-part of abandoned application Ser. No. 753,879, Aug. 20, 1968. This application Oct. 16, 1970, Ser. No. 81,588
Int. Cl. C07c *101/36*
U.S. Cl. 260—468 R 4 Claims
The phenyl, menthyl, and choline halide ester of 1-aminocyclopentanecarboxylic acid are pharmacologically active, showing the ability to block the immune response in warm-blooded animals.

3,655,726
**2,3-DIHALOALKYL COMPOUNDS**
James C. Wygant, Creve Coeur, Richard M. Anderson, St. Louis, and Erhard J. Prill, Des Peres, Mo., assignors to Monsanto Company, St. Louis, Mo.
No Drawing. Application Mar. 4, 1965, Ser. No. 437,258, now Patent No. 3,317,568, which is a continuation-in-part of applications Ser. No. 248,853, Jan. 2, 1963, and Ser. No. 267,783, Mar. 25, 1963. Divided and this application July 15, 1966, Ser. No. 620,190
Int. Cl. C07c *69/74*
U.S. Cl. 260—468 R 1 Claim
As new compounds, the 2,3-dibromopropyl esters of cycloalkane carboxylic acids or of bromine-substituted cycloalkane carboxylic acids having from 3 to 6 carbon atoms in the ring and from 2 to 4 carboxylic groups.

## 3,655,727
## CURING SYSTEMS FOR VINYLIDINE FLUORIDE ELASTOMERS

**Kalyanji U. Patel, St. Paul, and John E. Maier, Woodbury, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Continuation-in-part of application Ser. No. 831,295, June 9, 1969, which is a continuation-in-part of application Ser. No. 802,917, Feb. 27, 1969, which in turn is a continuation-in-part of application Ser. No. 753,618, Aug. 19, 1968. This application Jan. 16, 1970, Ser. No. 3,396**

**Int. Cl. C08f** *27/08*

**U.S. Cl. 260—470 P** **19 Claims**

A curable aromatic copolymer composition comprising vinylidene fluoride copolymer, at least one quaternary phosphonium or ammonium compound, and at least one elastomeric hydroxy or amino compound having an oxidation potential not more than 1.5 volts with respect to a standard calomel electrode and process for the curing thereof in the presence of an inorganic acid acceptor capable of generating water upon reacting with hydrogen fluoride.

## 3,655,728
## N-(2 - DIALKYLAMINOALKYLENE)-ESTERS OF FLUOROALKOXY-SUBSTITUTED ARYL CARBOXYLIC ACID AND SALTS THEREOF

**Arthur Mendel, Vadnais Heights, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.**

**No Drawing. Filed July 22, 1970, Ser. No. 57,351**

**Int. Cl. C07c** *69/76*

**U.S. Cl. 260—473 R** **9 Claims**

N - (2 - dialkylaminoalkylene)carboxylic esters of polyfluoroalkoxy-substituted aromatic acids. Also included are pharmaceutically acceptable salts of these compounds. These compounds have valuable local anesthetic activity.

## 3,655,729
## PROCESS FOR PREPARING ESTERS OF TEREPHTHALIC ACID

**Verne R. Rinehart, Akron, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio**

**No Drawing. Filed July 18, 1968, Ser. No. 745,677**

**Int. Cl. C07c** *69/82*

**U.S. Cl. 260—475 P** **2 Claims**

The invention relates to the preparation of polyesters from terephthalic acid and glycol using a fluid mixture of glycol and terephthalic acid as starting material. The fluid mixtures contain glycol to terephthalic acid in molar ratios of from about 0.9:1 to 1.3:1, the terephthalic acid being a mixture of particles of different sizes.

## 3,655,730
## CARBAMATES AND PESTICIDAL PREPARATIONS CONTAINING THEM

**Erwin Nikles, Liestal, Switzerland, assignor to Ciba Limited, Basel, Switzerland**

**No Drawing. Filed Sept. 9, 1968, Ser. No. 758,618**

**Claims priority, application Switzerland, Sept. 14, 1967, 12,862/67**

**Int. Cl. C07c** *125/06*

**U.S. Cl. 260—479 C** **10 Claims**

The invention comprises new alkenylaminophenylcarbamates and their use in preparations for combating pests, preferably insects and acarides.

## 3,655,731
## DIALKYLAMINO-BENZHYDRYL DICARBOXYLATES

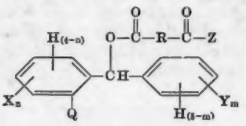
**Sidney B. Richter and David P. Mayer, Chicago, Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.**

**No Drawing. Filed Oct. 20, 1969, Ser. No. 867,891**

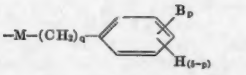
**Int. Cl. C07c** *69/34, 69/44*

**U.S. Cl. 260—485 H** **5 Claims**

This invention discloses new compounds of the formula



wherein X and Y are independently selected from the group consisting of alkyl, alkenyl, alkoxy, alkylthio, halogen, cyano, nitro and haloalkyl; Q is dialkylamino; R is an alkylene or alkenylene group of up to eight carbon atoms; *m* and *n* are each integers from 0 to 3; and Z is selected from the group consisting of hydroxy, alkoxy, haloalkoxy, amino, alkylamino, dialkylamino and



wherein M is selected from the group consisting of oxygen and —NH—; B is selected from the group consisting of alkyl, alkenyl, alkoxy, alkylthio, halogen, cyano, nitro and haloalkyl; and *q* and *p* are integers from 0 to 5. The compounds of the above description are useful as insecticides and acaricides.

## 3,655,732
## FLUORINATED ACRYLIC MONOMERS CONTAINING HETERO ATOMS AND THEIR POLYMERS

**Christian Scriver Rondestvedt, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**No Drawing. Filed May 16, 1967, Ser. No. 638,721**

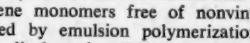
**Int. Cl. C07c** *69/54*

**U.S. Cl. 260—486 H** **3 Claims**

Perfluoroalkyl acrylic monomers of the formula

wherein $R_f$ is perfluoroalkyl; R′ and R″ are each alkylene; X is sulfur or —NR‴—; Y is oxygen, sulfur or —NR‴—; R‴ is hydrogen or lower alkyl; and R is hydrogen or methyl. Homopolymers of the above monomers and copolymers of the monomers with copolymerizable vinylidene monomers free of nonvinylic fluorine; both prepared by emulsion polymerization techniques with a free radical catalyst. Mixtures of the above polymers with a polymer derived from a polymerizable vinylidene monomer free of nonvinylic fluorine. Textile fabrics treated with the above polymers and mixtures of polymers to impart oil- and water-repellent properties to the fabric.

The preparation of the monomers from



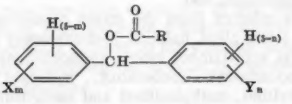
intermediates.

3,655,733
## PREPARATION OF POLYFUNCTIONAL ACRYLATES
F. Peter Guilmette, Mount Pleasant, and Norman L. Madison, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Apr. 19, 1968, Ser. No. 722,570
Int. Cl. C07c 69/54
U.S. Cl. 260—486 R 5 Claims

Methylene bisacrylate or methylene bismethacrylate is prepared by reacting methylene bromide, methylene iodide or a methylene bis (aromatic sulfonate) with an alkali metal acrylate or methacrylate. Reaction conditions are mild. The polyfunctional monomer is useful as a crosslinking agent in polymerization recipes.

3,655,734
## BENZHYDRYLALKANOATES
Sidney B. Richter and David P. Mayer, Chicago, Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.
No Drawing. Filed Aug. 9, 1968, Ser. No. 751,359
Int. Cl. C07c 69/62
U.S. Cl. 260—487 6 Claims

This invention discloses new 2-dialkylaminobenzhydryl esters of aliphatic acids having the general formula



(I)

wherein Z is dialkylamino; X and Y are independently selected from the group consisting of alkyl, alkenyl, halogen, nitro, alkoxy, dialkylamino and alkylthio; *m* is an integer from 0 to 4; *n* is an integer from 0 to 5; R is selected from the group consisting of alkyl, alkenyl, haloalkyl, haloalkenyl, alkoxyalkyl, alkylthioalkyl, cyanoalkyl, thiocyanoalkyl, dialkylaminoalkyl, cycloalkyl and cycloalkenyl. The compounds of the above description are useful as pesticides, particularly acaricides, insecticides and fungicides.

3,655,735
## PRODUCTION OF 3-METHYLBUT-2-EN-1-OL OR 3-METHYLBUT-2-EN-1-YL ACETATE
Horst Pommer, Ludwigshafen, Herbert Mueller, Frankenthal, Dietrich Mangold, Neckargemuend, and Hermann Overwien, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany
No Drawing. Filed Dec. 9, 1968, Ser. No. 782,420
Claims priority, application Germany, Mar. 22, 1968, P 77 68 023.8
Int. Cl. C07c 29/00, 67/00
U.S. Cl. 260—491 2 Claims

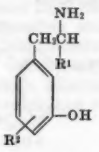
Production of 3-methylbut-2-en-1-ol and 3-methylbut-2-en-1-yl acetate by isomerizing 3-methyl-3-buten-1-ol or 3-methyl-3-buten-1-yl acetate with a catalytic amount of a carbonyl compound of a metal of subgroups 6 to 8 of the Periodic System.

3,655,736
## PREPARATION OF ENOL ESTERS FROM ALLENES
Charles J. Norton, Denver, and Byron C. Diehl, Allenspark, Colo., assignors to Marathon Oil Company, Findlay, Ohio
No Drawing. Filed May 1, 1968, Ser. No. 725,926
Int. Cl. C07c 67/04
U.S. Cl. 260—497 R 21 Claims

Enol esters are prepared by reacting allene and its derivatives and carboxylic acids in the presence of a catalyst wherein from about 0.01 to about 100 moles of allene or allene derivatives are present per mole of carboxylic acid at a temperature of from about 25 to about 500° C. at the desired pressure.

3,655,737
## 1-(3-HYDROXY-4-METHYL-PHENYL)-PROPYL-AMINE (-2) AND THE SALTS THEREOF
Per Arvid Emil Carlsson, Goteborg, Hans Rudolf Corrodi, Askim, Sven Göran Hallhagen, Molndal, and Ulf Krister Junggren, Goteborg, Sweden, assignors to Aktiebolaget Hassle, Goteborg, Sweden
No Drawing. Filed Mar. 28, 1969, Ser. No. 811,662
Claims priority, application Sweden, Apr. 1, 1968, 4,332/68
Int. Cl. C07c 87/28
U.S. Cl. 260—501.17 2 Claims

Compounds represented by the formula



wherein $R^1$ is a member of the group consisting of $CH_3$, $C_2H_5$ and $C_3H_7$, and $R^2$ in position 2, 4, 5 or 6 on the benzene nucleus is a member of the group consisting of F, Cl, Br, $CH_3$, $C_2H_5$ and $C_3H_7$, pharmaceutical compositions containing these compounds, and the use thereof for therapeutic purposes.

3,655,738
## PREPARATION OF DIPERPHTHALIC ACIDS
Donald R. Nielsen, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.
No Drawing. Continuation-in-part of application Ser. No. 655,994, July 26, 1967. This application Oct. 31, 1969, Ser. No. 873,058
Int. Cl. C07c 73/10
U.S. Cl. 260—502 R 8 Claims

Diperphthalic acids are prepared from hydrogen peroxide and the phthalic acid in an alkanesulfonic acid reaction medium by using finely subdivided phthalic acid with a particle dimension below 0.1 millimeter, more notably in the range of from 0.001 to 0.1 millimeter. A unique crystal form of diperisophthalic acid is obtained, for example, by reaction of isophthalic acid of less than 0.044 millimeter (less than 325 mesh).

3,655,739
## PROCESS FOR THE PRODUCTION OF NAPHTHALENESULFONIC ACID IN A PACKED REACTOR
Hermann Clasen, Falkenstein, Taunus, Germany, assignor to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany
Filed Mar. 18, 1968, Ser. No. 713,771
Claims priority, application Germany, Mar. 17, 1967, F 51,847
Int. Cl. C07c 143/24
U.S. Cl. 260—500 C 1 Claim

The exchange of material between liquid and gaseous phases is carried out in countercurrent flow in a column which is filled with packings so as to avoid vertical remixing of the downward flowing liquid under the action of the ascending gaseous phase. For carrying out the processes a column is used, the length of which is great in relation to its diameter, and which is fitted out with

a filling or with installations for inhibiting the remixing of the descending liquid.

The process is especially suitable for separating 1-naphthalene - sulfonic acid from a sulfonation mixture of naphthalene-sulfonic acids by hydrolysis with superheated steam.

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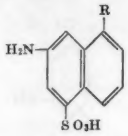
3,655,740

## METHOD FOR PRODUCING AMINO-NAPHTHALENE SULPHONIC ACIDS

**Horst Nickel and Fritz Suckfüll, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany**

**No Drawing. Filed July 22, 1968, Ser. No. 746,251**
**Claims priority, application Germany, July 31, 1967, F 53,106**
**Int. Cl. C07c** *143/64, 143/56*
**U.S. Cl. 260—509** **2 Claims**

Compounds of the formula



in which R is —OH or —$NH_2$ are prepared by nitrating 1-nitronaphthalene-5-sulfonic acid in oleum to give 1,7-dinitronaphthalene-5-sulfonic acid, reducing the latter to 1,7-diaminonaphthalene-5-sulfonic acid and optionally exchanging in known manner the 1-positioned amino group for a hydroxy group. These compounds are useful as intermediates in the preparation of azomethine dyestuffs, e.g. by condensation with aromatic aldehydes.

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3,655,741

## PRODUCTION OF o-BENZOYLBENZOIC ACID

**Hans Juergen Sturm and Herbert Armbrust, Gruenstadt, and Hans Nienburg and Wolfgang Eisfeld, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany**

**No Drawing. Filed June 23, 1970, Ser. No. 49,165**
**Claims priority, application Germany, July 4, 1969, P 19 34 055.7**
**Int. Cl. C07c** *65/20*
**U.S. Cl. 260—517** **11 Claims**

Production of o-benzoylbenzoic acid by oxidation of an indan with oxygen in the presence of a catalyst in the liquid phase. The product is a starting material for many syntheses (see for example Ullmanns Encyklopädie der Technischen Chemie, volume 3, pages 660 et seq.). It is of particular importance as a starting material for the manufacture of anthraquinone.

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3,655,742

## PROCESS FOR PRODUCING MAGNESIUM PROBENECID TETRAHYDRATE

**David J. Morgans, North Wales, Joseph F. Bavitz, Willow Grove, and Robert A. Castello, Doylestown, Pa., assignors to Merck & Co., Inc., Rahway, N.J.**

**No Drawing. Continuation-in-part of application Ser. No. 722,821, Apr. 17, 1968. This application Feb. 10, 1969, Ser. No. 798,109**
**Int. Cl. C07c** *101/42*
**U.S. Cl. 260—518 R** **2 Claims**

Magnesium probenecid tetrahydrate, an antigout therapeutic agent, is produced in high yield by a controlled reaction of probenecid acid and magnesium carbonate or equivalent magnesium salt.

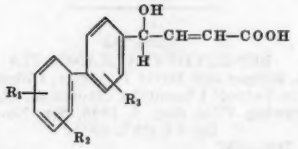
3,655,743

## SUBSTITUTED 4 - BIPHENYL-4-HYDROXY CROTONIC ACIDS AND SALTS THEREOF

**Josef Nickl and Wolfhard Engel, Biberach (Riss), Albrecht Eckenfels, Warthausen-Oberhofen, and Ernst Seeger and Gunther Engelhardt, Biberach (Riss), Germany, assignors to Boehringer Ingelheim G.m.b.H., Ingelheim (Rhine), Germany**

**No Drawing. Filed Nov. 12, 1970, Ser. No. 88,983**
**Claims priority, application Germany, Nov. 17, 1969, P 19 57 750.5; Sept. 29, 1970, P 20 47 804.0, P 20 47 805.1, P 20 47 802.8, P 20 47 803.9**
**Int. Cl. C07d** *87/36;* **C07c** *65/14*
**U.S. Cl. 260—247.2 R** **7 Claims**

Compounds of the formula



wherein, of the three substituents $R_1$, $R_2$ and $R_3$,

one is hydrogen, and

two are selected from the group consisting of hydrogen, lower alkyl, halogen, hydroxy-lower alkyl, nitro, amino, acetylamino, cyano, aminocarbonyl, dimethylaminocarbonyl, carbethoxy, hydroxyl, methoxy, methylthio, methylsulfinyl and methylsulfonyl,

and non-toxic, pharmacologically acceptable salts thereof; the compounds as well as their salts are useful as anticoagulants, antiphlogistics, analgesics and antitussives.

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3,655,744

## CARBOXYLATION OF METAL ARYLOXIDES

**Yutaka Yasuhara, Tatsuo Nogi, and Ikuzo Takahashi, Shizuoka-ken, Japan, assignors to Toray Industries, Inc., Tokyo, Japan**

**No Drawing. Continuation-in-part of application Ser. No. 658,654, Aug. 7, 1967. This application Feb. 2, 1971, Ser. No. 112,087**
**Int. Cl. C07c** *65/04*
**U.S. Cl. 260—521 R** **5 Claims**

A process for preparing a metal salt of an aromatic hydroxycarboxylic acid and a free acid thereof which comprises reacting by heating an aromatic compound selected from a metal phenoxide or derivative thereof and/or metal salt beta-naphthol with carbon monoxide and a carboxylating reagent consisting of a Na, K, Li, Cs, Rb, Ca or Ba salt of carbonic acid and thereafter separating the metal salt of an aromatic hydroxycarboxylic acid.

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3,655,745

## PREPARATION OF METHACRYLIC ACID

**Donald M. Fenton, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.**

**No Drawing. Filed Sept. 6, 1968, Ser. No. 758,146**
**Int. Cl. C07c** *57/04, 57/08*
**U.S. Cl. 260—526 N** **7 Claims**

Allyl compounds are reacted with carbon monoxide in the presence of a platinum group metal catalyst and a modifier which is a low molecular weight alkanoic acid and/or a hydrohalic acid to prepare alpha, beta-unsaturated carboxylic acids having a high content of desired methacrylic acid and minor amounts of crotonic acid as the major by-products. The contacting is effected at mild conditions with temperatures from 25° to 350° C. and pressures from 1 to about 1000 atmospheres and can be

performed under vapor phase of liquid phase conditions, the latter being preferred. In a typical embodiment, allyl chloride is carbonylated by contacting the compound with carbon monoxide and an aqueous or anhydrous solution of acetic acid containing palladium at a temperature of about 150° C. to produce methacrylic and crotonic acids or anhydrides thereof.

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3,655,746

## PROCESS FOR PRODUCING MONOSODIUM GLUTAMATE

**Tetsuya Shiraishi, Kakogawa, Jun Utsugi, Takasago, Koji Tanaka, Kakogawa, and Yasunori Tokuda, Takasago, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan**

**No Drawing. Filed Apr. 23, 1970, Ser. No. 31,394**
**Claims priority, application Japan, Apr. 23, 1969, 44/31,917**
**Int. Cl. C07c *99/12***
**U.S. Cl. 260—527 N** **2 Claims**

Process for producing monosodium glutamate, which comprises contacting a glutamic acid fermentation broth at a pH between about 5 and about 9 with an amount of 1 litre by wet volume of a strongly basic anion exchange resin relative to about 0.2 to 0.6 molecular equivalent at the anionic impurities contained in said broth; adding to the effluent from the resin a stoichiometric amount of sodium hydroxide relative to the glutamic acid contained therein; and recovering the crystals of monosodium glutamate thus obtained.

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3,655,747

## PROCESS FOR THE MANUFACTURE OF CARBOXYLIC ACIDS

**Kurt Sennewald and Wilhelm Vogt, Knapsack, near Cologne, Heinz Erpenbach, Surth, near Cologne, and Hermann Glaser, Knapsack, near Cologne, Germany, assignors to Knapsack Aktiengesellschaft, Knapsack, near Cologne, Germany**

**No Drawing. Filed Mar. 22, 1968, Ser. No. 715,146**
**Claims priority, application Germany, Apr. 1, 1967, K 61,875**
**Int. Cl. C07c *51/26***
**U.S. Cl. 260—530 R** **12 Claims**

Carboxylic acids are produced by oxidation of aliphatic aldehydes with oxygen or an oxygen-containing gas mixture in the gas phase in contact with a catalyst by oxidizing an aliphatic aldehyde containing from 2 to 6 carbon atoms at elevated temperatures in the presence of a carrier catalyst containing metallic palladium and/or palladium oxide and/or a palladium salt and at least one further substance comprising platinum, rhodium, ruthenium, iridium, copper, silver, gold, zinc, cadmium, tin, lead, bismuth, chromium, molybdenum, tungsten, manganese, iron, cobalt, nickel or tellurium in metallic form or in oxide or salt form, and/or an alkali metal or alkaline earth metal compound as an activator.

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3,655,748

## SYNTHESIS OF ε-AMINOCAPROIC ACID FROM ε-CAPROLACTAM

**Milan Tandara, Sarajevo, Yugoslavia, assignor to Bosnalijek, Sarajevo, Yugoslavia**

**Filed Apr. 29, 1969, Ser. No. 820,069**
**Claims priority, application Yugoslavia, Dec. 26, 1968, P 3,106**
**Int. Cl. C07c *101/04, 99/06***
**U.S. Cl. 260—534 R** **10 Claims**

ε-Aminocaproic acid is produced by the hydrolytic decomposition of ε-caprolactam wherein a mixture of the lactam and $Ba(OH)_2 \cdot 8H_2O$ is dissolved in a mixed solvent consisting of water and dimethylsulfoxide (DMSO). The barium salt of the acid which is formed is then converted to the free acid by adding gaseous carbon dioxide which forms insoluble $BaCO_3$.

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3,655,749

## CONVERSION OF PROPYLENE AND ISOBUTENE TO THE CORRESPONDING UNSATURATED ALDEHYDES AND ACIDS

**John A. Ondrey, Springdale, and Harold E. Swift, Gibsonia, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.**

**No Drawing. Filed June 2, 1969, Ser. No. 829,701**
**Int. Cl. C07c *57/04***
**U.S. Cl. 260—530 N** **10 Claims**

A method of oxidizing propylene and isobutene to the corresponding unsaturated aldehydes and acids and for oxidizing the unsaturated aldehydes of propylene and isobutene to the corresponding unsaturated acids by the vapor phase reaction with molecular oxygen in the presence of a catalyst of cobalt molybdate promoted with a composition of vanadium, tellurium and oxygen. Propylene is converted to acrolein and acrylic acid and acrolein is converted to acrylic acid.

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3,655,750

## METHOD FOR PRODUCING UNSATURATED ALDEHYDES AND ACIDS

**John A. Ondrey, Springdale, and Harold E. Swift, Gibsonia, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.**

**No Drawing. Filed June 2, 1969, Ser. No. 829,721**
**Int. Cl. C07c *57/04***
**U.S. Cl. 260—530 N** **10 Claims**

A method of oxidizing propylene and isobutene to the corresponding unsaturated aldehydes and acids and for oxidizing the unsaturated aldehydes of propylene and isobutene to the corresponding unsaturated acids by the vapor phase reaction with molecular oxygen in the presence of a catalyst of cobalt molybdate promoted with a composition of tungsten, tellurium and oxygen. Propylene is converted to acrolein and acrylic acid and acrolein is converted to acrylic acid.

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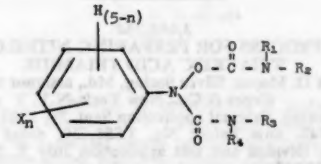
3,655,751

## N,O-DICARBAMOYL-N-PHENYLHYDROXYLAMINES

**John Krenzer, Oak Park, and Sidney B. Richter, Chicago, Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.**

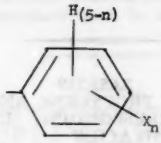
**No Drawing. Filed Jan. 3, 1968, Ser. No. 695,362**
**Int. Cl. C07c *127/16, 127/18, 127/20***
**U.S. Cl. 260—545 R** **7 Claims**

New compounds of the formula:



wherein each X is independently selected from the group consisting of halogen, alkyl, alkenyl, haloalkyl, nitro, alkoxy, alkylthio, alkylsulfoxide, alkylsulfone and dialkyl-

amino; *n* is an integer from 0 to 4; $R_1$ is selected from the group consisting of alkyl, alkenyl, haloalkyl, and



wherein X and *n* are as heretofore described; and $R_2$, $R_3$ and $R_4$ are each independently selected from the group consisting of hydrogen, alkyl, alkenyl and haloalkyl. A herbicidal and fungicidal composition comprising an inert carrier and as an essential active ingredient, in a quantity toxic to weeds or fungi, a compound of the above description. A method for the control of weeds and fungi which comprises applying to said weeds or fungi a herbicidal and fungicidal composition comprising an inert carrier and, as an essential active ingredient, in a quantity toxic to weeds or fungi, a compound heretofore described.

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**3,655,752**
**ISOMERS OF 2,4,6-TRIHALO-N,N,N',N'-TETRAALKYLISOPHTHALAMIDES**
**James H. Ackerman, Bethlehem, and George M. Laidlaw, East Greenbush, N.Y., assignors to Sterling Drug Inc., New York, N.Y.**
**No Drawing. Filed June 20, 1969, Ser. No. 835,233**
**Int. Cl. C07c *103/34***
**U.S. Cl. 260—558 A** **4 Claims**

Geometrical isomers of 5-amino-2,4,6-trihalo-N,N,N',-N'-tetraalkylisophthalamides are prepared by separation of the isomer mixtures formed either from halogenation of 5 - amino - N,N,N',N' - tetraalkylisophthalamides or by amidation of the corresponding 5-amino-2,4,6-trihaloisophthalic acids. Deamination via diazotization leads to the corresponding compounds lacking the 5-amino group. The products are useful as intermediates for radiopaques and as tranquilizing and fungistatic agents.

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**3,655,753**
**RECOVERY OF COLOR-FORMING COUPLERS**
**Austin C. Cooley, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**
**No Drawing. Filed Oct. 2, 1969, Ser. No. 863,324**
**Int. Cl. C07c *103/26***
**U.S. Cl. 260—559 R** **9 Claims**

The separation of 2,4-bis(benzenesulfonamido)phenol balancing developing agent from N-(o-acetamido phenethyl)-1-hydroxy - 2 - naphthamide color-forming coupler is accomplished by techniques employing an oxidizing agent, advantageously supplied by aeration, in strongly alkaline solutions containing the coupler and balancing developing agent, separating resulting solids from the solution, and lowering the solution pH to precipitate the coupler.

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**3,655,754**
**PROCESS FOR PREPARING NITRILOTRIACETIC ACID TRIAMIDE**
**Joseph D. Moyer, Silver Spring, Md., assignor to W. R. Grace & Co., New York, N.Y.**
**No Drawing. Original application Sept. 20, 1967, Ser. No. 673,245, now Patent No. 3,558,630, dated Jan. 26, 1971. Divided and this application July 9, 1970, Ser. No. 53,662**
**Int. Cl. C07c *103/00***
**U.S. Cl. 260—561 A** **5 Claims**

Nitrilotriacetic acid is reacted with an amide to form 3,5-dioxo-1-piperazineacetamide which is reacted with ammonia or ammonium hydroxide to form nitrilotriacetic acid triamide.

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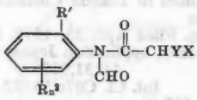
**3,655,755**
**N-FORMYL-α-HALO-ACETANILIDES**
**John F. Olin, Manchester, Mo., assignor to Monsanto Company, St. Louis, Mo.**
**No Drawing. Continuation-in-part of application Ser. No. 624,110, Jan. 27, 1967, which is a division of application Ser. No. 348,862, Mar. 2, 1964. This application May 20, 1970, Ser. No. 39,176**
**Int. Cl. C07c *103/32***
**U.S. Cl. 260—562 B** **12 Claims**

Compounds of the formula



wherein R' is alkyl; $R^2$ is halogen, alkyl or alkoxy; *n* is an integer 0 to 4, X is chlorine, bromine and iodine and Y is hydrogen or halogen.

These compounds have herbicidal activity.

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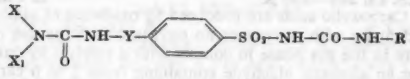
**3,655,756**
**BENZENESULFONYL UREAS HAVING HYPOGLYCEMIC ACTIVITY**
**Helmut Weber and Rudi Weyer, Frankfurt am Main, Walter Aumuller and Karl Muth, Kelkheim, Taunus, and Kurt Stach, Mannheim, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany**
**No Drawing. Continuation-in-part of applications Ser. No. 511,990, Dec. 6, 1965, and Ser. No. 636,290, May 5, 1967. This application Feb. 14, 1969, Ser. No. 799,534**
**Claims priority, application Germany, Dec. 8, 1964, F 44,630**
**Int. Cl. C07c *127/00***
**U.S. Cl. 260—553 D** **16 Claims**

Benzenesulfonyl urea compounds that are effective as oral antidiabetic agents are disclosed to have the formula



wherein

R is

(a) alkyl or alkenyl of 3–6 carbon atoms,
(b) endoalkylene-cyclohexyl, endoalkylene - cyclohexenyl, endoalkylene-cyclohexylmethyl or endoalkylene-cyclohexenylmethyl of 1–2 endoalkylene carbon atoms,
(c) benzyl, phenylethyl,
(d) cyclohexyl methyl,
(e) lower alkyl cyclohexyl or dialkyl cyclohexyl methyl cyclopentyl,
(f) cycloalkyl of 5–8 carbon atoms in the ring
(g) cyclohexenyl, cyclohexenyl-methyl, methylcyclohexenyl, or
(h) nortricyclyl,

X is

(a) phenyl, trifluoromethyl phenyl, phenyl substituted by one to two substituents selected from the group consisting of halogen, lower alkyl and lower alkoxy, or
(b) benzyl,

$X_1$ is alkyl of 1 to 3 carbon atoms, and
Y is a saturated hydrocarbon of 1 to 3 carbon atoms.

3,655,757

## 1-β-HYDROXY-β-PHENYLETHYLGUANIDINE

Roy Fielden, Welwyn Garden City, England, Albert Lawrence Green, Glasgow, Scotland, and Derek William Hills, Welwyn Garden City, England, assignors to Smith Kline & French Laboratories, Philadelphia, Pa.

No Drawing. Original application Mar. 29, 1966, Ser. No. 538,227, now Patent No. 3,377,245, dated Apr. 9, 1968. Divided and this application Jan. 16, 1968, Ser. No. 698,137

Int. Cl. C07c *129/00*

U.S. Cl. 260—564 A 4 Claims

The laevo-β-hydroxy-β-phenylethylguanidine isomer is disclosed along with its hypotensive properties which distinguish it from its dextro isomer or racemic mixture.

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3,655,758

## IMINOCARBONYL DERIVATIVES

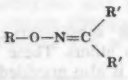
George A. Kurhajec, North Oaks, and Erwin W. Neuvar, White Bear Lake, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Filed Oct. 10, 1966, Ser. No. 587,369

Int. Cl. C07c *131/00*

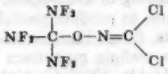
U.S. Cl. 260—566 AE 6 Claims

1. A compound of the formula



wherein R is alkyl, haloalkyl containing from 1 to 4 chlorine or bromine atoms, fluoroalkyl or fluoramino-substituted polyfluoroalkyl, said alkyl or substituted alkyl radicals having from 1 to 12 carbon atoms in a straight or branched chain; and R′ is chlorine, bromine, fluorine, —$NF_2$, —$NH_2$, —NHR″, —$N(R'')_2$ or —OR″, wherein R″ is a lower alkyl radical.

2. O-tris(difluoramino)methoxyiminocarbonyl chloride according to claim 1, having the formula



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3,655,759

## PROCESS FOR THE PREPARATION OF CYCLOHEXANONE OXIME

Walter Krönig and Johann Grolig, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Continuation of application Ser. No. 622,064, Mar. 10, 1967. This application Nov. 13, 1969, Ser. No. 871,587

Claims priority, application Germany, Mar. 19, 1966, F 48,711

Int. Cl. C07c *131/04*

U.S. Cl. 260—566 A 8 Claims

Production of optionally alkyl-substituted cyclohexanone oxime by reacting the corresponding cyclohexanone with ammonia and hydrogen peroxide in aqueous phase in the presence of a tungsten catalyst at a temperature between about −20 to +50° C., with both the starting cyclohexanone compound and the ammonia being used in molar excess with respect to the amount of hydrogen peroxide used.

3,655,760

## CYCLIC PROCESS FOR THE PREPARATION OF AN OXIME FROM A HYDROXYLAMMONIUM SALT SOLUTION

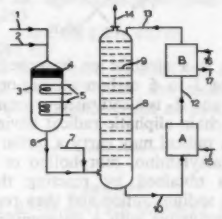
Abraham H. de Rooij, Gellen, and Jan Elemndorp, Brunssum, Netherlands, assignors to Stamicarbon N.V., Heerlen, Netherlands

Filed Nov. 12, 1969, Ser. No. 875,724

Claims priority, application Netherlands, Nov. 12, 1968, 6816074

Int. Cl. C07c *131/00*; C01c *1/28*; C01b *21/40*

U.S. Cl. 260—566 A 3 Claims




A cyclic process for the preparation of an oxime from a ketone and a hydroxylammonium salt is disclosed in which an aqueous acid reaction medium is circulated between a hydroxylammonium salt synthesis zone wherein nitrate ions are catalytically reduced to form a hydroxylammonium salt in the aqueous acid reaction medium, and an oxime synthesis zone wherein the hydroxylammonium salt is reacted with ketone to form an oxime. The nitrate ions reduced in the hydroxylammonium salt synthesis zone are replenished by the absorption of nitrous gases in the aqueous acid reaction medium resulting in formation of nitric acid.

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3,655,761

## CERTAIN OXIME ESTERS

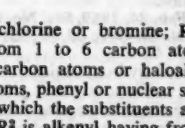
Arnold D. Gutman, Berkeley, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 649,024, June 26, 1967. This application Dec. 4, 1969, Ser. No. 882,299

Int. Cl. C07c *131/00*

U.S. Cl. 260—566 AE 4 Claims

Compounds having the formula



in which X is chlorine or bromine; R is hydrogen or alkyl having from 1 to 6 carbon atoms; $R^1$ is alkyl having 1 to 4 carbon atoms or haloalkyl having from 1 to 4 carbon atoms, phenyl or nuclear substituted derivatives thereof in which the substituents are halogen, nitro or lower alkyl; $R^2$ is alkenyl having from 2 to 4 carbon atoms. The compounds are useful in controlling weeds and for inhibiting the growth of bacteria and fungi.

## 3,655,762
## 9-AMINOALKYL-9-ALKYL- OR ARYL-SULPHONYL-FLUORENES

**Jean A. Gautier, Marcel Y. Miocque, Henri Moskowitz, and Janine L. Blanc-Guenee, Paris, Guy M. Raynaud, Meudon la Foret, and Nicole A. M. Dorme, Paris, France, assignors to Delalande S.A., Courbevoie, Hauts-de-Seine, France**

**No Drawing. Filed July 23, 1969, Ser. No. 844,209**
**Int. Cl. C07c *87/28***
**U.S. Cl. 260—570.8 TC** **2 Claims**

A compound of the formula

in which $R_1$ is a straight or branched chain aliphatic radical having 1 to 6 carbon atoms, or a phenyl or p-tolyl radical, and $R_2$ is a saturated or unsaturated, straight or branched chain aliphatic radical having 1 to 5 carbon atoms, which radical may carry a tertiary amino radical, such as a dialkylamino, morpholino or piperidino. The compound is obtained by reacting the corresponding fluorene with sodium amide and then reacting the resulting sodium derivative with a halogenide of the formula $X—R_2$, wherein X is a halogen. The compounds possess diuretic and analgesic properties.

## 3,655,763
## PREPARATION OF N,N'-DIARYL-1,4-DIAMINO-NAPHTHALENE COMPOUND

**Donald M. Fenton, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.**

**No Drawing. Filed July 17, 1968, Ser. No. 745,350**
**Int. Cl. C07c *87/66***
**U.S. Cl. 260—576** **6 Claims**

The title compounds are prepared from naphthalene using the process of this invention which comprises reacting a 1,4-naphthadiol bearing a substituent on the number 2 ring position with an alkali metal bisulfite to obtain a derivative having an alkali metal sulfonate in the 3 position and thereafter contacting the resultant sulfonate with an aryl amine hydrohalide to add the amino groups in the 1 and 4 positions and to simultaneously desulfonate the naphthalene nucleus. The sulfonation step is performed at mild conditions from 25° to 200° C. and the addition of the aryl amine hydrohalide is performed at a temperature of from 100° to 350° C. The subject compounds produced by this process are useful as antioxidants and in particular are useful as antioxidants in rubber compositions by incorporation in rubber in amounts from about 0.01 to about 5.0 weight percent in the conventional manner for the use of antioxidants.

## 3,655,764
## CONTINUOUS PROCESS FOR MAKING HYDROXYLAMINES

**Henry Bader, Newton Center, and Alexander Boag, Arlington, Mass., assignors to Polaroid Corporation, Cambridge, Mass.**

**Filed Feb. 24, 1969, Ser. No. 801,550**
**Int. Cl. C07c *83/02, 83/04***
**U.S. Cl. 260—584 C** **10 Claims**

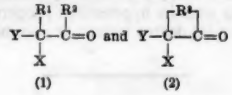
N,N-disubstituted hydroxylamines are prepared in improved yields by continuously and progressively reacting the corresponding secondary amine with an inorganic peroxide at elevated temperatures and continuously quenching the reaction as the peroxide becomes consumed by rapidly cooling the reaction mixture to below about 25° C.

## 3,655,765
## HALOGEN CONTAINING KETONES, ACID HALIDES AND PROCESSES

**Samuel Gelfand, Niagara Falls, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.**

**No Drawing. Continuation-in-part of application Ser. No. 306,278, Sept. 3, 1963, which is a continuation-in-part of application Ser. No. 157,007, Dec. 4, 1961. This application Feb. 15, 1968, Ser. No. 705,615**
**Int. Cl. C07c *49/28, 49/00***
**U.S. Cl. 260—586 R** **2 Claims**

There are provided novel halogenated ketones of the formulae

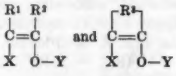


(1) (2)

wherein

X is selected from the group consisting of chlorine bromine, fluorine and hydrogen;
$R^1$ is selected from the group consisting of hydrogen, chlorine, bromine, fluorine and halo alkyl;
$R^2$ is halo alkyl;
$R^3$ is halo alkylene of from three to four carbon atoms; and
Y is allyl;

said $R^1$, $R^2$ and $R^3$ substituents containing a maximum of two hydrogen atoms. These ketones are useful as pesticides. There is also provided a process for preparing these ketones comprising heating a compound of the formulae



until the desired compound is produced. The ketones of this invention are useful as chemical intermediates for example, in the making of Diels-Alder adducts with hexahalocyclopentadiene, to produce pesticidal compounds active against insects, fungi, bacteria and nematodes. They are also useful as olefinic monomers which may be polymerized to moldable plastics which exhibit flame retardant characteristics.

## 3,655,766
## PHOSPHORANYLIDENE SUBSTITUTED CYCLIC COMPOUNDS

**Gail H. Birum, Kirkwood, and Clifford N. Matthews, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.**

**No Drawing. Continuation-in-part of application Ser. No. 567,066, July 22, 1966. This application June 7, 1968, Ser. No. 735,190**
**Int. Cl. C07c *49/27***
**U.S. Cl. 260—586 R** **2 Claims**

Stable, ylide-substituted 1,3-cyclobutanediones are synthesized from triorganophosphoranylideneketene and aldehydes or active ketones. Analogous adducts are formed from triorganophosphoranylideneketene and ketenes in a one-step reaction. In contrast to the above reactions yielding substituted 1,3-cyclobutanediones, reaction of aryl isocyanates with triorganophosphoranylideneketene results in 2:1 adducts having six-membered ring structures. The new compounds are useful as fire retardants, biological toxicants, plasticizers, textile treating agents and lubricant additives.

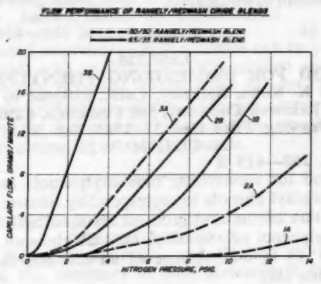
## 3,655,767
## FLOW CHARACTERISTICS OF WAXY PETROLEUM RESIDUUM

**Roy John Ott, Riverdale, N.Y., and Harold Nelson Miller, Millington, N.J., assignors to Esso Research and Engineering Company**

**Original application Sept. 20, 1965, Ser. No. 488,707. Divided and this application Apr. 25, 1968, Ser. No. 724,245**

**Int. Cl. C07c** *49/76*

**U.S. Cl. 260—592** **3 Claims**




A process for preparing blending agents for improving the flow characteristics of high wax-containing oils by adding a $C_{18}$–$C_{24}$ carboxylic acid halide-Friedel-Crafts catalyst complex to styrene dissolved in a solvent and simultaneously polymerizing and acylating said styrene monomer.

## 3,655,768
## PRODUCTION OF ALK-1-EN-6-ONES

**Horst Pommer, Ludwigshafen, Herbert Mueller, Frankenthal, and Hermann Overwien, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany**

**No Drawing. Filed Nov. 13, 1968, Ser. No. 775,518**

**Int. Cl. C07c** *49/20, 49/45, 49/76*

**U.S. Cl. 260—593 R** **9 Claims**

Production of alk-1-en-6-ones by reaction of an alk-1-en-4-ol at from 100° to 400° C. with a ketone bearing at least one hydrogen atom on a carbon atom in vicinal position to the carbonyl group.

## 3,655,769
## OXIDATION OF n-PARAFFINS

**Matthew A. McMahon, Wappingers Falls, N.Y., assignor to Texaco Inc., New York, N.Y.**

**No Drawing. Filed Sept. 25, 1967, Ser. No. 670,374**

**Int. Cl. C07c** *45/02, 31/00*

**U.S. Cl. 260—597** **7 Claims**

A method of oxidizing n-paraffins of between about 6 and 20 carbons having an ultraviolet light absorbancy of at least about 1 at 260–280 mμ to produce oxidates rich in secondary alkanols comprising contacting said n-paraffin with oxygen in the presence of between about .001 and 5 wt. percent of a peroxide selected from the group consisting of t-butyl hydroperoxide and di-t-butyl peroxide and between about 1 and 15 wt. percent of a boron compound selected from the group consisting of boric oxide, boric acid and alkyl metaborate of between about 3 and 15 carbons, said wt. percent based on said n-paraffin.

## 3,655,770
## PROCESS OF PRODUCING SALICYLALDEHYDE

**Frank Cyril Buckley, Healdgreen, England, assignor to Ciba-Geigy AG, Basel, Switzerland**

**No Drawing. Filed May 5, 1969, Ser. No. 821,965**

**Int. Cl. C07c** *45/00*

**U.S. Cl. 260—600** **9 Claims**

A process for the preparation of salicylaldehyde, comprising the acid hydrolysis of tri-(o-dichloromethyl phenyl)phosphate to salicylaldehyde is described. The sodium salt of a condensation product of naphthalene sulfonic acid and formaldehyde is added during the hydrolysis, whereby contamination of the reaction vessel by a hard, red by-product resin is avoided.

## 3,655,771
## PROCESS FOR PRODUCING FORMALDEHYDE

**Hachiro Tadenuma, Akita-shi, Torajiro Murakami, Tokyo, and Hirotsugu Mitsushima, Akita-shi, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan**

**No Drawing. Continuation-in-part of application Ser. No. 379,030, June 29, 1964. This application Sept. 4, 1968, Ser. No. 776,293**

**Int. Cl. C07c** *45/16*

**U.S. Cl. 260—603 HF** **14 Claims**

Formaldehyde is prepared by oxidizing dimethyl ether or a mixture of dimethyl ether and methanol with air in the presence of a tungsten oxide catalyst.

## 3,655,772
## NAPHTHYL AND ANTHRACENYL BUTENYL SULFONES

**Charles H. Chang, Piscataway, N.J., and David I. Randall, Easton, Pa., assignors to GAF Corporation, New York, N.Y.**

**No Drawing. Continuation-in-part of application Ser. No. 605,622, Dec. 29, 1966. This application Dec. 24, 1969, Ser. No. 888,062**

**Int. Cl. C07c** *147/08*

**U.S. Cl. 260—607 A** **5 Claims**

The reaction of 1,3-butadiene with polycyclic sulfonyl halides, and resulting products containing a nuclearly substituted $-SO_2CH_2CH{=}CHCH_2X$ group, X being halo, useful as herbicides, pesticides, and intermediates for dyes and the like.

## 3,655,773
## METHOD FOR MAKING THIOETHERS

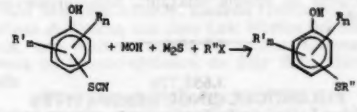
**Walter Reifschneider, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.**

**No Drawing. Filed Mar. 2, 1970, Ser. No. 15,846**

**Int. Cl. C07c** *149/32*

**U.S. Cl. 260—609 F** **4 Claims**

Phenolic thioethers are prepared by reacting a thiocyanophenol with an alkylating agent in the presence of a base and an alkali metal or ammonium sulfide according to the following representative equation wherein reactants and the phenolic thioether product are set forth:




wherein R is a fluoro, chloro, bromo, iodo, lower alkyl or lower alkoxy group; R′ is an R or a lower alkenyl, lower alkynyl, 3 to 6 carbon cycloalkyl, 6 to 10 carbon aryl, substituted phenyl, 7 to 8 carbon phenalkyl, phenoxy, cyano, amido, amino, lower alkylamino, lower alkylthio, hydroxy, or lower acyloxy group; $n$ is an integer from 0 to 4; $m$ is an integer from 0 to 2; the sum of $m+n$ is an integer from 0 to 4; M is alkali metal or ammonium; R″ is a 1 to 12 carbon alkyl, (cyano-lower alkyl), lower alkenyl, lower alkynyl, 3 to 6 carbon cycloalkyl, or 7 to 8 carbon phenalkyl group; and X is a halide, sulfonate, sulfate or other similar anion group.

3,655,774
## METHOD FOR PRODUCING LOW MOLECULAR WEIGHT THIOETHERS

Yves Labat, Pau, France, assignor to Societe Nationale des Petroles d'Aquitaine tour Aquitaine, Courbevoie, France

No Drawing. Filed Apr. 28, 1969, Ser. No. 819,943
Claims priority, application France, Apr. 30, 1968, 150,081, 150,082
Int. Cl. C07c *149/06, 149/10*
U.S. Cl. 260—609 A 10 Claims

A method is described, which permits of easily and economically preparing mixtures of thioethers

$$HS(CH_2S)_nH$$

substantially OH free having an enhanced content of methane-dithiol $HSCH_2SH$ and monothioether dithiol $HSCH_2SCH_2SH$; the average value of $n$ of the mixtures is about 1.2 to 2.6. The method consists in reacting monothioether diol $HOCH_2SCH_2OH$ or formaldehyde HCHO, or a mixture of these two compounds, preferably in aqueous solution, with at least 2.5 moles $H_2S$ per mole of the compound or compounds between 20° and 90° C.; the pH of the reaction medium is adjusted to a value comprised between 8 and a minimum which is a linear function of temperature, and is defined by the extreme limits: 6.8 at 20° C. and 3.3 at 90° C. The thioethers formed are then separated by conventional means from the reaction medium, after excess $H_2S$ has been degassed.

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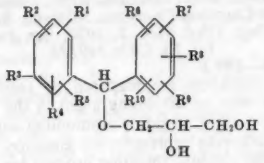
3,655,775
## GLYCERYL ETHERS

Wijbe Thomas Nauta, Nieuw Loosdrecht, Netherlands, assignors to N.V. Koninklijke Pharmaceutische Fabrieken v/h Brocades-Stheeman & Pharmacia, Amsterdam, Netherlands

No Drawing. Filed Sept. 13, 1967, Ser. No. 667,378
Claims priority, application Great Britain, Sept. 16, 1966, 41,540/66
Int. Cl. C07c *43/20*
U.S. Cl. 260—611 A 2 Claims

The invention disclosed herein relates to glyceryl ethers having the general Formula I

(I)



The compounds of this invention have been found to have activity as muscle relaxants, anti-convulsives and sedatives.

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3,655,776
## PHLOROGLUCINOL DERIVATIVES

Victor Lafon, Paris, France, assignor to Societe Anonyme dite: Orsymonde, Paris, France

No Drawing. Filed Sept. 4, 1969, Ser. No. 855,371
Claims priority, application Great Britain, Sept. 9, 1968, 42,870/68
Int. Cl. C07c *43/22*
U.S. Cl. 260—613 D 3 Claims

This invention is concerned with new phloroglucinol derivatives obtained by condensing a molecule of 1,3,5-trihydroxy-benzene with one or two molecules of glycol chlorhydrin.

(2-chloroethoxy) - 3,5 - dihydroxy-benzene has anti-spasmodic properties and 3,5-di(2-chloroethoxy)-phenol shows tranquilising activities.

3,655,777
## HYDROGENATION OF UNSATURATED ALDEHYDES TO UNSATURATED ALCOHOLS

Paul N. Rylander and Duane R. Steele, Newark, N.J., assignors to Engelhard Minerals & Chemicals Corporation, Newark, N.J.

No Drawing. Filed Nov. 12, 1968, Ser. No. 775,156
Int. Cl. C07c *33/00, 33/06;* C11b *9/00*
U.S. Cl. 260—618 H 3 Claims

Alpha,beta-olefinically unsaturated aldehydes are hydrogenated to the corresponding unsaturated alcohols using osmium as tht catalyst.

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3,655,778
## METHOD FOR ISOMERIZING PHENYLPHENOLS

Gustave K. Kohn, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Filed Dec. 27, 1968, Ser. No. 787,627
Int. Cl. C07c *39/12*
U.S. Cl. 260—619 R 5 Claims

Method for isomerizing monoarylphenols and monoarylmonoalkyl phenols to corresponding isomers in which the position of the aryl group is changed by heating the monoarylphenol or monoaryl monoalkylphenol to about 160–250° C. in the presence of an acid-activated montmorillonite clay.

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3,655,779
## COLOR STABILIZATION OF ORTHO-BENZYL PARACHLORPHENOL

Frederic J. Shelton, Tacoma, Wash., assignor to Reichhold Chemicals, Inc., White Plains, N.Y.

Filed Oct. 29, 1968, Ser. No. 771,594
Int. Cl. C07c *37/22*
U.S. Cl. 260—619 R 1 Claim

This invention discloses a composition, comprising ortho-benzyl parachlorophenol and a color stabilizer therefor. This color stabilizer includes from about 0.01% to about 0.5% thiourea and from about 0.025% to about 0.75% of an organic phosphite by weight, based upon ortho-benzyl parachlorophenol.

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3,655,780
## ISOMERIZATION PROCESS

Gustave K. Kohn and Lawrence E. Stevick, Berkeley, Calif., assignors to Chevron Research Company, San Francisco, Calif.

No Drawing. Continuation-in-part of application Ser. No. 547,145, May 3, 1966. This application Sept. 3, 1968, Ser. No. 757,129
Int. Cl. C07c *39/06*
U.S. Cl. 260—624 E 10 Claims

Process for isomerizing o- and p-alkylphenols in which the alkyl contains at least 5 carbon atoms to their corresponding m-alkylphenols involving heating the o- and p-species in the presence of an acid-activated alumina-silicate clay having (1) a general crystal lattice comprising a sheet of alumina-octahedra between 2 sheets of silica-tetrahedra, (2) a (001) lattice spacing of 10 to 20 A., (3) less than 1.4 weight percent bound iron, (4) a cationic base exchange capacity of 80 to 120 meq. and (5) base-exchange positions occupied predominantly by Group II metal ions.

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3,655,781
## CRYSTALLIZATION OF 2-NITRO-2-METHYL-1-PROPANOL

Wallace F. Runge and Robert E. Laine, Terre Haute, Ind., assignors to Commercial Solvents Corporation, New York, N.Y.

No Drawing. Filed July 22, 1969, Ser. No. 843,792
Int. Cl. C07c *79/18*
U.S. Cl. 260—643 A 7 Claims

A process for the purification and crystallization of 2-nitro-2-methyl-1-propanol (NMP) by treating a solu-

tion thereof with dilute hydrogen peroxide to remove free formaldehyde, concentrating the solution to obtain a melt and slowly introducing the melt into a chilled non-solvent liquid and recovering the crystallized NMP thereby obtained.

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**3,655,782**
**DIALKYLATION OF HALOADAMANTANES**
**Robert E. Moore, Wilmington, Del., assignor to Sun Oil Company, Philadelphia, Pa.**
**No Drawing. Filed Aug. 30, 1968, Ser. No. 756,431**
**Int. Cl. C07c** *1/26, 17/00, 23/38*
**U.S. Cl. 260—648 R** **19 Claims**

Dialkylated adamantane hydrocarbons can be prepared in high yields with an $AlBr_3$ or $AlCl_3$ catalyst and ethylene in a highly branched hydrocarbon solvent. The use of a solvent containing tertiary hydrogen atoms is contraindicated by the prior art because of the possibility of the solvent competing in the alkylations.

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**3,655,783**
**SELECTIVE EXTRACTION OF META-CHLOROTOLUENE**
**John D. Bacha, Monroeville, and Charles M. Selwitz, Pitcairn, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.**
**No Drawing. Filed Dec. 3, 1969, Ser. No. 881,849**
**Int. Cl. C07c** *25/04*
**U.S. Cl. 260—650 R** **13 Claims**

Meta-chlorotoluene is separated from a mixture containing the three isomers thereof by contacting the mixture with hydrogen fluoride, boron trifluoride and a light hydrocarbon, such as hexane, at a temperature below about 60° C.

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**3,655,784**
**CHLORINATED BENZENE PRODUCTION**
**Simon Pierce Burns, Austin, Tex., assignor to Jefferson Chemical Company, Inc., Houston, Tex.**
**Filed Nov. 3, 1969, Ser. No. 873,588**
**Int. Cl. C07c** *25/12*
**U.S. Cl. 260—650 R** **2 Claims**

Hexachlorobenzene is produced from benzene and chlorine by a vapor-phase process wherein a diluted mixture ot benzene and chlorine are heated to a temperature of at least 400° C. to initiate a noncatalytic vapor-phase reaction.

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**3,655,785**
**METHOD OF MAKING PERFLUOROSTYRENE**
**Leo A. Wall, McLean, Va., and Joseph M. Antonucci, Hyattsville, Md., assignors to the United States of America as represented by the Secretary of the Navy**
**No Drawing. Original application Aug. 12, 1963, Ser. No. 301,681, now Patent No. 3,513,206. Divided and this application Nov. 6, 1969, Ser. No. 874,671**
**Int. Cl. C07c** *25/04*
**U.S. Cl. 260—651 F** **2 Claims**

A method of making perfluorostyrene in which (2-chloro 1,2,1-trifluoroethyl)perfluorobenzene is brought into contact with molten potassium hydroxide which may be on carbon pellets.

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**3,655,786**
**PROCESS FOR PREPARING FLUOROISOBUTYLENES AND NOVEL PRODUCT**
**Everett E. Gilbert and Robert E. A. Dear, Morristown, N.J., assignors to Allied Chemical Corporation, New York, N.Y.**
**No Drawing. Filed Sept. 10, 1968, Ser. No. 758,689**
**Int. Cl. C07c** *21/18*
**U.S. Cl. 260—653.3** **6 Claims**

Process for preparing fluoroisobutylenes by reaction of a fluoro tertiary butyl alcohol with sulfur tetrafluoride and a new fluoroisobutylene product. Copolymers of fluoroisobutylenes with other ethylenically unsaturated compounds are useful in the production of elastomeric and resinous compositions.

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**3,655,787**
**QUENCHING VINYL CHLORIDE CONTAINING GAS STREAMS**
**Daniel E. Wiley, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.**
**Continuation-in-part of application Ser. No. 488,358, Sept. 20, 1965. This application Nov. 15, 1968, Ser. No. 776,207**
**Int. Cl. C07c** *21/06*
**U.S. Cl. 260—656 R** **15 Claims**

An improved method of operating a system for producing vinyl chloride from a 1,2-dichloroethane pyrolytic decomposition operation is described. The gas stream produced by the pyrolytic decomposition of 1,2-dichloroethane contains vinyl chloride, HCl, unreacted 1,2-dichloroethane, tars and carbonaceous solids. This gas stream is passed below the surface of a liquid body of hydrocarbon chlorides upon issuing from the cracking furnace and as it emerges from the liquid body, the gas then passes through a conventional gas-liquid contact zone for cooling. Passage of the gas through the liquid body removes tars and solids entrained in the gas stream and in this manner prevents fouling in the gas-liquid contact zone, stills and other auxiliary equipment. 1,2-dichloroethane is the liquid disclosed as the preferred hydrocarbon chloride for the liquid body. Passage of the gas through the liquid body is at a point at least 8 inches below the surface of the liquid body.

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**3,655,788**
**PHOSGENE AS A NOVEL CATALYST FOR THE ABNORMAL ADDITION OF HBr TO ALPHA-OLEFINS**
**Robert M. Thomas and Fred R. Gerns, West Lafayette, Ind., assignors to Great Lakes Chemical Corporation, West Lafayette, Ind.**
**No Drawing. Filed July 3, 1969, Ser. No. 839,064**
**Int. Cl. C07c** *17/08*
**U.S. Cl. 260—663** **9 Claims**

Long chain alpha-olefins of at least six carbon atoms undergo anti-Markownikoff addition when treated with hydrogen bromide in the presence of phosgene to produce primary alkyl bromides.

This invention relates to the preparation of alkyl bromides by anti-Markownikoff, or free radical addition of hydrogen bromide to alpha-olefinic hydrocarbons. More particularly, the invention relates to a novel catalyst for effecting this addition.

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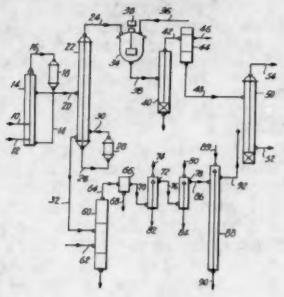
**3,655,789**
**PROCESS FOR THE MANUFACTURE OF CARBON TETRACHLORIDE**
**Francisco Martinez-Alvarez, Ricardo Garcia Ruiz, Jaime Molinae de Porras, and Jose Luis Merina del Rio, Flix, Spain, and Walter Bertsch, Heimchen, Germany, assignors to Electro-Quimica de Flix S.A., Barcelona, Spain**
**Filed Sept. 4, 1968, Ser. No. 757,230**
**Claims priority, application Spain, Sept. 11, 1967, 344,937**
**Int. Cl. C07c** *19/06*
**U.S. Cl. 260—664** **3 Claims**

A process for the production of carbon tetrachloride by the synthesis of carbon disulfide and chlorine is shown. The reaction takes place in the liquid phase in a medium of reaction product at a temperature between 105° C. and 130° C. and the heat of reaction is removed by vapors generated in the reaction zone. Crude carbon tetrachloride is first distilled to remove sulfur monochloride byproduct, then contacted with an aqueous alkaline solution to decompose sulfur chlorides and then subjected to two stages of distillation, to remove inorganic and or-

ganic impurities. Also shown is a process for recovering sulfur and hydrogen chloride from by-product sulfur monochloride. A vapor stream of sulfur monochloride is reduced at 350° to 500° C. with hydrogen. Crude hydrogen chloride vapor is first freed of residual sulfur monochloride and then absorbed in an aqueous medium. Sulfur



is maintained at a temperature of 250° C. or more to prevent contamination with sulfur monochloride before removal to storage. In a preferred embodiment a vapor stream of sulfur monochloride from crude carbon tetrachloride distillation, is directly transferred to the reduction reactor.

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3,655,790

## STABLE COMPLEXES OF ORGANOMAGNESIUMS WITH ALKALI METAL HYDRIDES

Eugene C. Ashby, 2516 Flair Knoll Drive NE., Atlanta, Ga. 30329

No Drawing. Filed Feb. 9, 1970, Ser. No. 9,998
Int. Cl. C07f *1/02, 1/04, 3/02*
U.S. Cl. 260—665 R 23 Claims

Stable complexes of organomagnesiums, such as di-s-butylmagnesium, with alkali metal hydrides, such as potassium hydride. They are useful for a variety of purposes, such as reducing agents for organic compounds and as metalating agents for aromatic compounds.

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3,655,791

## DIMERIZATION OF DIOLEFINIC COMPOUNDS

Edwin L. De Young, Chicago, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed Oct. 7, 1970, Ser. No. 78,952
Int. Cl. C07c *3/10*
U.S. Cl. 260—666 B 6 Claims

Diolefinic compounds are dimerized in the presence of certain organo metallic halide catalysts at dimerization conditions to produce novel compositions of matter which are useful as aroma chemicals.

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3,655,792

## METHOD FOR CARRYING OUT REACTIONS OF UNSATURATED HYDROCARBONS AT LOW TEMPERATURES

Maurice M. Mitchell, Jr., Wallingford, Pa., Harold M. Fisher, Charlotte, N.C., and Edward S. Tomezsko, Media, Pa., assignors to Atlantic Richfield Company, New York, N.Y.

No Drawing. Original application Feb. 20, 1969, Ser. No. 801,205. Divided and this application Nov. 6, 1970, Ser. No. 87,619
Int. Cl. C07c *5/24*
U.S. Cl. 260—666 P 3 Claims

Method for carrying out alkylation, polymerization or hydrogenation reactions of unsaturated hydrocarbons by contacting the unsaturated hydrocarbon such as an olefin or aromatic or combination thereof with tungsten hexafluoride at temperatures between 0° C. to 50° C.

3,655,793

## DIMERIZATION OF CONJUGATED DIENES

Charles L. Myers, Parkersburg, W. Va., assignor to Phillips Petroleum Company

No Drawing. Continuation-in-part of application Ser. No. 889,748, Dec. 31, 1969. This application Dec. 10, 1970, Ser. No. 97,016
Int. Cl. C07c *3/60*
U.S. Cl. 260—666 B 16 Claims

Conjugated dienes, such as butadiene, are dimerized to substituted cyclohexenes, such as 4-vinylcyclohexene, by contacting the diene with a catalyst formed from (I) a dinitrosyliron halide and (II) an organoaluminum halide such as diethylaluminum chloride, an alkali metal hydride, or complex hydrides of alkali metals and boron or aluminum.

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3,655,794

## RECOVERY OF CRUDE CIS,TRANS,TRANS-CYCLODODECATRIENE - 1,5,9 HAVING A LOW CHLORINE CONTENT

Hanns Strache and Rolf Dammermann, Marl, Germany, assignors to Chemische Werke Huels A.G., Marl, Germany

No Drawing. Filed Mar. 21, 1969, Ser. No. 809,420
Claims priority, application Germany, Mar. 28, 1968, P 17 68 067.0
Int. Cl. C07c *1/00*
U.S. Cl. 260—666 B 13 Claims

To lower the content of chlorine-containing by-products in the crude cis,trans,trans-cyclododecatriene-1,5,9 obtained from the trimerization of 1,3-butadiene in the presence of titanium halogenides and alkyl aluminum halides in an inert solvent, after the trimerization is completed, there is added ammonia which suppresses the formation of chlorine-containing compounds, and thereafter water which results in the catalyst residue precipitating in large granules, facilitating a decanting or filtration step.

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3,655,795

## TRIMERIZATION OF BUTADIENE

David Lee Sullivan, Victoria, Tex., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Jan. 11, 1971, Ser. No. 105,647
Int. Cl. C07c *3/18*
U.S. Cl. 260—666 B 7 Claims

This invention relates to an improved process for the trimerization of butadiene to cyclododecatriene-(1,5,9) using a catalyst comprising an organoaluminum sesquichloride and a titanium compound wherein increased yield of the desired product and improved operability of the process are realized by recycling into the reaction zone at least a portion of the by-product 1,5-cyclooctadiene and 4-vinylcyclohexene from the trimerization reaction.

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3,655,796

## CYCLOALKENYL TRICYCLOALKENES USED TO PRODUCE ELASTOMERS BY COPOLYMERISATION WITH OLEFINES

Yves Amiard, Pau, and Jean-Paul Bellissent, Billere, France, assignors to Societe Anonyme dite: Societe Nationale des Petroles d'Aquitaine, Courbevoie, France

No Drawing. Filed June 16, 1969, Ser. No. 833,696
Claims priority, application France, June 17, 1968, 155,189
Int. Cl. C07c *13/28, 13/54, 13/62*
U.S. Cl. 260—666 PY 12 Claims

Cycloalkenyl tricycloalkenes are novel polycyclic compounds which may include substituents such as methyl, ethyl or others. They can be prepared by reacting a substituted or unsubstituted cyclic 1,3-diene with a 2,2'-bicycloalkenyl compound. The cycloalkenyl tricycloalkenes can be used to produce elastomers by copolymerisation with non-conjugated polyenes and/or olefines.

3,655,797

## ALKYLATION PROCESS

Louis Schmerling, Riverside, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed Sept. 24, 1970, Ser. No. 75,030
Int. Cl. C07c 3/56
U.S. Cl. 260—671 12 Claims

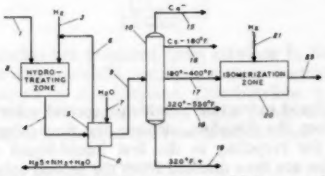
Improved yields of alkylated aromatic hydrocarbons are obtained when an aromatic hydrocarbon is reacted with a saturated hydrocarbon in the presence of a catalyst comprising a Friedel-Crafts metal halide mixed with a higher valence halide of a metal which forms at least two metal halides and in the presence of an excess amount of an oxygen-containing gas.

3,655,798

## CATALYTIC ISOMERIZATION PROCESS

Sigmund M. Csicsery, Lafayette, and Bernard F. Mulaskey, Fairfax, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Mar. 19, 1970, Ser. No. 21,152
Int. Cl. C07c 5/24, 15/02
U.S. Cl. 260—668 A 10 Claims




A catalytic isomerization process which comprises contacting a hydrocarbon feedstock at catalytic isomerization conditions with a catalyst comprising a synthetic interstratified smectite-illite clay-type aluminosilicate component and at least one additional component comprising a metal.

3,655,799

## PROCESS FOR HYDROGENATING UNSATURATED ORGANIC COMPOUNDS

Christian Lassau, Paris, and Lucien Sajus, Croissy, Seine, France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, Rueil Malmaison, Hauts-de-Seine, France

No Drawing. Filed June 26, 1970, Ser. No. 50,324
Claims priority, application France, July 2, 1969, 6922455
Int. Cl. C07c 5/00
U.S. Cl. 260—666 P 12 Claims

This invention relates to a two-step process for hydrogenating unsaturated organic compounds, the first step being conducted in homogeneous phase and the second step in heterogeneous phase.

3,655,800

## METHOD FOR CARRYING OUT REACTIONS OF UNSATURATED HYDROCARBONS AT LOW TEMPERATURES

Maurice M. Mitchell, Jr., Wallingford, Pa., Harold M. Fisher, Charlotte, N.C., and Edward S. Tomezsko, Media, Pa., assignors to Atlantic Richfield Company, New York, N.Y.

No Drawing. Original application Feb. 20, 1969, Ser. No. 801,205. Divided and this application Nov. 6, 1970, Ser. No. 87,620
Int. Cl. C07c 3/56
U.S. Cl. 260—671 5 Claims

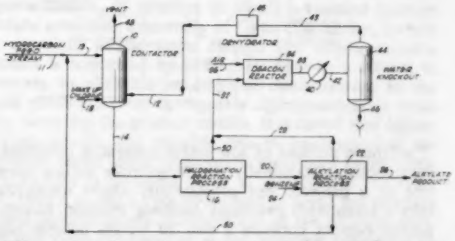
Method for carrying out alkylation, polymerization or hydrogenation reactions of unsaturated hydrocarbons by contacting the unsaturated hydrocarbon such as an olefin or aromatic or combination thereof with tungsten hexafluoride at temperatures between 0° C. and 50° C.

3,655,801

## PROCESS FOR PRODUCING FREE HALOGEN FROM HYDROGEN HALIDE AND UTILIZING THE FREE HALOGEN IN HALOGENATION REACTIONS

Lyndon D. Boyer, Ponca City, Okla., Arnold L. Coldiron, Ridgefield, Conn., and Soon Y. Wong, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Aug. 11, 1969, Ser. No. 848,809
Int. Cl. C07c 3/54
U.S. Cl. 260—671 B 24 Claims




The present invention relates to an improved process for producing free halogen from hydrogen halide and utilizing the free halogen produced in halogenation reactions. The hydrogen halide produced in reactions wherein a hydrocarbon feed stream is halogenated, or reactions wherein a hydrocarbon feed stream is halogenated and then used to alkylate a cyclic organic compound, is oxidized to form an effluent gas stream containing free halogen, water and other gases. In one aspect of the present invention the effluent gas stream is intimately contacted with the hydrocarbon feed stream so that the free halogen is selectively absorbed in the hydrocarbon feed stream, and the remaining effluent gas stream is vented from the process. Another aspect of the invention relates to utilizing the effluent gas stream directly for effecting the halogenation reaction, separating the hydrogen halide produced from the other gases by absorbing the hydrogen halide in water and venting the other gases.

3,655,802

## PROCESS FOR OBTAINING CRUDE ANTHRACENE FROM MIXTURES CONTAINING PHENANTHRENE, ANTHRACENE AND THEIR HOMOLOGS

Herbert Buffleb, Castrop-Rauxel, Heinz Gerhard Franck, and Rudolf Oberkobusch, Duisburg-Meiderich, Johannes Turowski, Castrop-Rauxel, Gerd Collin, Duisburg-Meiderich, and Maximilian Zander, Castrop-Rauxel, Germany, assignors to Rutgerswerke Aktiengesellschaft, Frankfurt am Main, Germany

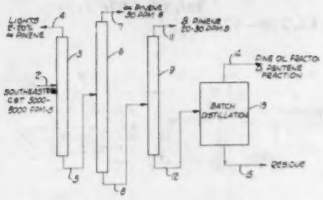
No Drawing. Filed Jan. 28, 1970, Ser. No. 6,574
Claims priority, application Germany, Feb. 12, 1969, P 19 06 807.6
Int. Cl. C07c 3/58
U.S. Cl. 260—672 7 Claims

Increased yields of crude anthracene are obtained from a mixture containing phenanthrene, anthracene, and their homologs, e.g., from a fraction having a boiling range of 338–355° C., obtained preferably from a residual oil from benzene pyrolysis to ethylene rich in aromatic substances, by reacting said fraction at temperatures between 700 and 850° C., preferably between 750 and 800° C., with a time of stay of 1 to 10 seconds, with a tenfold to twenty-fold molecular excess of hydrogen and separating the anthracene from the reaction product in conventional manner. From the reaction product a crude anthracene of 55% and a yield of 60% based on the weight of anthracene present in the reaction product, can be obtained by fractional distillation.

## 3,655,803
## PROCESS FOR PRODUCING ALPHA-PINENE OF LOW SULFUR CONTENT FROM CRUDE SULFATE TURPENTINE

Frank L. Miller, P.O. Box 389, Jacksonville, Fla. 32201

Filed Sept. 28, 1970, Ser. No. 76,003
Int. Cl. C07c *13/00*; C09f *3/02*
U.S. Cl. 260—675.5 6 Claims




α-Pinene product of low sulfur content is produced by continuously fractionally distilling crude sulfate turpentine at a pressure not substantially above atmospheric into a sulfur-rich overhead distillate fraction having α-pinene content between 2 and 20 weight percent and a bottoms fraction of higher boiling materials, and fractionally distilling said bottoms fraction to recover said product as an α-pinene distillate fraction.

## 3,655,804
## ALKYNE CONVERSION

Filippo Pennella, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed Aug. 12, 1968, Ser. No. 751,756
Int. Cl. C07c *11/28, 5/26*
U.S. Cl. 260—678 15 Claims

One or more alkynes are converted to other alkynes by contact with a catalyst active for the disproportionation of propylene to ethylene and butene.

## 3,655,805
## DEHYDROGENATION PROCESS

Louis J. Croce, Seabrook, Tex., and Laimonis Bajars, Princeton, and Maigonis Gabliks, Highland Park, N.J., assignors to Petro-Tex Chemical Corporation, Houston, Tex.

No Drawing. Continuation-in-part of application Ser. No. 459,878, May 28, 1965. This application Nov. 29, 1968, Ser. No. 780,271
Int. Cl. C07c *5/18*
U.S. Cl. 260—680 E 10 Claims

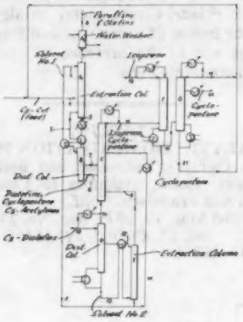
Oxidative dehydrogenation of organic compounds in presence of compositon comprising crystalline composition of iron, Group III–B metals and oxygen, preferably ferrites.

## 3,655,806
## $C_5$-HYDROCARBON MIXTURES SUBJECTED TO LIQUID-LIQUID EXTRACTIONS AND EXTRACTIVE DISTILLATION USING PLURAL SOLVENT SYSTEMS

Hans-Walther Brandt, Cologne-Flittard, Bruno Engelhard, Cologne-Stammheim, Heinrich Steude, Leverkusen, Helmut Scherb, Sinnersdorf, and Bernhard Schleppinghoff and Gunther Schnuchel, Dormagen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, and Erdolchemie Gesellschaft mit Beschrankter Haftung, Cologne, Germany

Filed Aug. 20, 1969, Ser. No. 851,587
Claims priority, application Germany, Aug. 24, 1968, P 17 93 273.9
Int. Cl. B01d *3/34*
U.S. Cl. 260—681.5 8 Claims

Process of separating $C_5$-hydrocarbon mixtures containing $C_5$ paraffins and $C_5$ diolefins. The mixture is subjected to a first liquid-liquid extraction with a solvent selective for the diolefins. The resulting solvent laden with diolefins is subjected to an extractive distillation in which some of the diolefins are removed leaving an extractive distillation liquid effluent laden with some of the diolefins. The last mentioned liquid effluent is subjected to a second liquid-liquid extraction in which a second solvent extracts therefrom the diolefins, yielding the first solvent in condition for recycling to the first liquid-liquid extraction. Diolefins are then distilled from the second solvent. Thus, the first solvent need not be subjected to extensive distillation, so that the first solvent need not be highly resistant to heating.



## 3,655,807
## DODECYLBENZENESULFONIC ACID ADDITION IN SULFURIC ACID ALKYLATION

Marvin S. Rakow, East Brunswick, and William H. Lockwood, Jr., Hightstown, N.J., assignors to Cities Service Oil Company, Tulsa, Okla.

No Drawing. Filed Oct. 30, 1970, Ser. No. 85,743
Int. Cl. C07c *3/54*
U.S. Cl. 260—683.63 3 Claims

An improvement for a conventional alkylation process is disclosed in which a low molecular weight olefin and an isoparaffin are mixed in contact with an acid catalyst at controlled temperatures. The improvement comprises the addition of small concentrations of dodecylbenzenesulfonic acid to improve the quality and yield of the desired branched chain paraffinic isomers or alkylate produced in the gasoline boiling range.

## 3,655,808
## PREPARATION OF OILS FROM ISOBUTENE

Gary L. Driscoll, Boothwyn, Pa., assignor to Sun Oil Company, Philadelphia, Pa.

No Drawing. Filed July 6, 1970, Ser. No. 52,772
Int. Cl. C07c *3/10*
U.S. Cl. 260—683.15 D 12 Claims

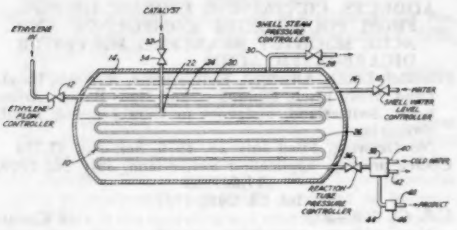
Polymerization of isobutene to form a polyisobutene oil having a viscosity index of from 90–130, in the presence of a lower alkylhalide such as 2-chloro-2-methylpropane using a catalyst selected from the class consisting of ethyl aluminum sesquichloride, ethyl aluminum dichloride and diisobutyl aluminum chloride and a solvent selected from the class consisting of nitromethane and nitrobenzene at from —30 to 100° C. and preferably from 0° C. to 50° C. Optionally a metal halide such as cobalt chloride may be used as a promoter for the catalyst.

3,655,809

## CONVERSION OF ETHYLENE TO ALPHA OLEFINS IN THE PRESENCE OF A DIISOBUTYLENE SOLVENT

Herbert B. Fernald and William Gall, Glenshaw, Bernard H. Gwynn, Gibsonia, and John V. Ward, Oakmont, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Mar. 17, 1970, Ser. No. 20,355
Int. Cl. C07c 3/10
U.S. Cl. 260—683.15 D 5 Claims




Alpha olefins are produced from ethylene in the presence of an organometallic catalyst, such as triethylaluminum, dissolved in diisobutylene. Diisobutylene is easily separated from the desired alpha olefin products and its presence increases catalyst and reactor efficiencies.

3,655,810

## PROCESS FOR DIMERIZING AND CODIMERIZING OLEFINS

Yves Chauvin, Orsay, Gilles Lefebvre, La Celle-St.-Cloud, and Masahiro Uchino, Rueil-Malmaison, France, assignors to Institut Francais du Petrole des Carburants et Lubrifiants, Rueil-Malmaison, France

No Drawing. Filed Nov. 14, 1967, Ser. No. 683,020
Claims priority, application France, Nov. 15, 1966, 83,739, 83,740; Mar. 21, 1967, 99,721
Int. Cl. C07c 3/10
U.S. Cl. 260—683.15 D 30 Claims

A process for dimerizing and codimerizing monoolefins wherein at least one of said monoolefins is contacted with a catalyst to effect reaction thereof, said catalyst containing a monohalogenodihydrocarbylaluminum and nickel or a nickel compound, and said process being characterized in that the reaction is conducted in the presence of water in an amount sufficient to increase significantly the activity of said catalyst.

3,655,811

## OLEFIN POLYMERIZATION PROCESS

Jin Sun Yoo, Riverdale, Ill., assignor to Atlantic Richfield Company

No Drawing. Filed July 15, 1968, Ser. No. 744,665
Int. Cl. C07c 3/10
U.S. Cl. 260—683.15 D 19 Claims

A catalyst composition consisting essentially of:

(A) An actinide series metal compound, e.g., thorium nitrate tetrahydrate,

(B) A reducing agent, e.g., ethylaluminum sesquichloride,

(C) A non-protonic Lewis acid, e.g., ethylaluminum sesquichloride, and, as optional, preferred ingredients,

(D) A trihydrocarbylphosphine, e.g., triphenylphosphine, and

(E) An inert, organic solvent, e.g., chlorobenzene, is disclosed as being useful for catalyzing the polymerization of olefins or phenyl-substituted olefins to normally liquid polymers or oligomers, e.g., for catalyzing the dimerization of propylene.

3,655,812

## PROCESS FOR PRODUCING LINEAR ALPHA OLEFINS

Arthur W. Langer, Jr., Watchung, N.J., assignor to Esso Research and Engineering Company

No Drawing. Filed Mar. 3, 1969, Ser. No. 804,007
Int. Cl. C07c 3/10
U.S. Cl. 260—683.15 D 11 Claims

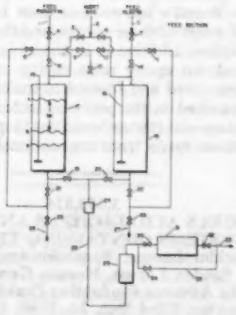
An improved process for catalytic polymerization, or oligomerization, of ethylene to obtain a reaction product mixture consisting essentially of $C_4$ to $C_{200}$ olefins, including especially linear alpha olefins. The oligomerization reaction is conducted by adding ethylene to a diluent at pressures to maintain an ethylene concentration in the liquid phase sufficient to suppress copolymerization reactions involving the product olefins. It is found that higher catalyst activity and stability can be maintained if the transition metal halide and organo aluminum halide catalytic mixture is modified, prior to initiation of the reaction, with a strong Lewis acid added in small but effective critical concentrations. Modification of the catalytic mixture also permits operation at temperatures ranging, e.g., about 20 to 60 centigrade degrees higher than permitted by use of an unmodified catalyst and hence refrigeration needs are reduced, or eliminated.

3,655,813

## CONTINUOUS ALKYLATION PROCESS

Francis W. Kirsch, Wayne, John D. Potts, Springfield, and David S. Barmby, Media, Pa., assignors to Sun Oil Company, Philadelphia, Pa.

Continuation-in-part of application Ser. No. 716,190, Mar. 26, 1968, which is a continuation-in-part of application Ser. No. 581,129, Aug. 25, 1966. This application June 5, 1969, Ser. No. 830,687
Int. Cl. C07c 3/52
U.S. Cl. 260—683.43 11 Claims



Olefin-paraffin alkylate is continuously produced by contacting in the liquid phase a $C_3$–$C_9$ monoolefin with a $C_4$–$C_6$ isoparaffin in the presence of a substantially anhydrous crystalline alumino-silicate zeolite, continuously feeding monoolefin and isoparaffin and withdrawing reaction product at the same rate, while allowing said catalyst to remain intact within the system for a period less than about 60 hours before continuously feeding active catalyst and withdrawing aged catalyst from the system at the same rate. The aged catalyst is then regenerated by subjecting it to a regenerant selected from the group consisting of air, an inert gas, inert sorbate, or mixtures thereof, and is ultimately reactivated.

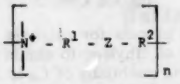
3,655,814

## VISCOELASTIC CATIONIC POLYMERS CONTAINING THE URETHANE LINKAGE

Alan Rembaum, Altadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed May 19, 1969, Ser. No. 825,489
Int. Cl. C08g 22/04
U.S. Cl. 260—77.5 Q 11 Claims

A viscoelastic cationic polymer having a repeating unit of the formula:



where Z is a linking condensation residue, preferably urethane and *n* is an integer prepared by linking reactions between monomeric starting materials including quaternary nitrogen forming coreactants and condensation residue forming coreactants.

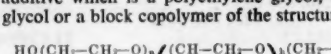
3,655,815

## THROMBORESISTANT ARTICLES CONTAINING EPOXY RESINS AND POLYETHYLENEOXIDE-POLYPROPYLENE OXIDE BLOCK COPOLYMERS

Ival O. Salyer, Dayton, and Albert J. Blardinelli, Kettering, Ohio, assignors to the United States of America as represented by the Secretary, Department of Health, Education, and Welfare

No Drawing. Filed May 20, 1970, Ser. No. 39,858
Int. Cl. C08g 45/00
U.S. Cl. 260—830 R 6 Claims

Articles (includes containers, conduits, devices or materials) for handling (includes containing, transporting or contacting) blood and reducing clotting comprising a mixture of an epoxy resin; with from about 0.5 to 20% by weight based on said resin of a thromboresistant polymer additive which is a polyethylene glycol, a polypropylene glycol or a block copolymer of the structure



wherein *a*, *b* and *c* are each at least 1 and represent the number of moles of these groups, and the molecular weight of the polymer additive is in the range of about 500 to 15,000; and, an epoxy resin curing agent, said mixture having been cured and formed to make said articles. The articles described in the previous sentence have improved nonthrombogenic (thromboresistant) properties as compared to those made from conventional epoxy resins.

3,655,816

## PHOSPHORUS ACID-DIESTERS AND EPOXY RESIN SYSTEMS CONTAINING THE SAME

Hans Joachim Lorenz, Bensheim-Auerbach, and Hans-Jurgen Sander, Lorsch, Hessen, Germany, assignors to Deutsche Advance Produktion GmbH

No Drawing. Filed Dec. 24, 1969, Ser. No. 888,034
Int. Cl. C08g 45/06, 30/14
U.S. Cl. 260—830 R 4 Claims

An epoxy resin system of conventional composition with hardening agents and possibly further customary additives, containing also as hardening accelerator from 0.1 to 150, and preferably from 5 to 20, parts by weight of a phosphorous acid-diester of the general formula:

in which R and R' can be the same or different and signify straight chain alkyl containing from 1 to 14 carbon atoms, branched alkyl containing from 3 to 14 carbon atoms, straight chain alkoxyalkyl having 2 to 14 carbon atoms, branched alkoxyalkyl having 3 to 14 carbon atoms, alkenyl and substituted alkenyl, aryl, and aralkyl and alkaryl wherein the alkyl portions contain from 1 to 9 carbon atoms, and at least one of the substituents R and R' contains at least one chlorine and/or bromine atom, per 100 parts by weight of epoxy resin, and a phosphorous acid-diester of the same general formula wherein R and R' are different.

3,655,817

## ADDUCTS, CONTAINING EPOXIDE GROUPS, FROM POLYEPOXIDE COMPOUNDS AND ACID, SLIGHTLY BRANCHED POLYESTER DICARBOXYLIC ACIDS

Friedrich Lohse, Allschwil, Rolf Schmid, Reinach, Basel-Land, Willy Fisch, Binningen, and Hans Batzer, Arlesheim, Switzerland, assignors to Ciba Limited, Basel, Switzerland

No Drawing. Filed July 23, 1970, Ser. No. 57,774
Claims priority, application Switzerland, July 30, 1969, 11,607/69
Int. Cl. C08g 45/14
U.S. Cl. 260—835 18 Claims

New adducts, containing epoxide groups, of polyepoxide compounds and polyesters of succinic acid and 1,4-butanediol which are slightly branched, possess terminal carboxyl groups and have an average molecular weight of about 1200 to 20,000, manufactured by reaction of, for example, 11 mols of succinic anhydride with 10 mols of 1,4-butanediol, with 0.1 to at most 0.65 carboxyl group equivalent of the acid polyester being employed for the (so-called) "advancement" per 1 equivalent of epoxide groups of the polyepoxide compound. By curing with customary curing agents for epoxide resins, the adducts containing epoxide groups can be converted into elastomeric moulded materials which possess a significantly greater hardness and toughness and a surprisingly high crystallization transition point of 70–100° C.

3,655,818

## PARTICULATE ADHESIVE CONTAINING POLYEPOXIDES, CARBOXYLATED BUTADIENE-ACRYLONITRILE COPOLYMER, AND A UREA DERIVATIVE AS A CURING AGENT

Alan G. McKown, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 18, 1968, Ser. No. 768,675
Int. Cl. C08g 45/04
U.S. Cl. 260—837 14 Claims

A curable structural adhesive in flowable, particulate form comprising an epoxy resin modified with a nitrile rubber preferably containing free carboxyl groups, and an epoxy curing system which preferably will provide a cure at a temperature not exceeding about 250° F. Upon subjection to about 150° F., the adhesive converts to a state in which it will readily adhere to various substrates including metals. Also provided are a process for applying the adhesive as well as the substrates containing the adhesive both in the fused, non-cured state and the cured state.

3,655,819

## POLYAMIDE FILAMENTS CONTAINING POLYALKYLENE ETHERS AND PHENOLIC ANTIOXIDANTS

Lamberto Crescentini, Chester, Va., assignor to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Dec. 9, 1968, Ser. No. 782,432
Int. Cl. C08g 41/04
U.S. Cl. 260—857 PE 19 Claims

A filament, having improved resistance to light, of a polyamide having incorporated therethrough about 0.3 to 7 weight percent, based on the weight of the polyamide,

of a poly(alkylene ether) having a molecular weight from about 600 to 3,000,000, and about 0.05 to 2 weight percent, based on the weight of the polyamide, of a sterically hindered phenolic compound.

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3,655,820
**PROCESS FOR THE MANUFACTURE OF POLYESTER RESINS**

**Josef Kaupp, Wiesbaden, Germany, assignor to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany**

**No Drawing. Continuation-in-part of application Ser. No. 745,121, July 16, 1968. This application Sept. 1, 1970, Ser. No. 68,777**

**Claims priority, application Germany, Aug. 3, 1967, C 43,029**

**Int. Cl. C08f** *21/00, 21/02*

**U.S. Cl. 260—861** **9 Claims**

The invention provides a process for the manufacture of polyester resins having a high flexural strength and impact strength. This is achieved by using high molecular weight polycarboxylic acid esters produced as by-product residues in the oxidation and esterification of p-xylene to give terephthalic acid esters and the recovery of the terephthalic acid esters from the reaction mixture. The high molecular weight polycarboxylic acid esters are distilled from the residues, transesterified with polyhydric alcohols, esterified with maleic acid and cured with olefinically unsaturated compounds such as styrene, acrylic and methacrylic esters and diallylphthalate to produce the polyester resin.

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3,655,821
**POLYAMIDE FILAMENTS CONTAINING ANTISTATIC POLYETHER PREPARED FROM A POLYALKYLENE AND AN ALIPHATIC DICARBOXYLIC ACID**

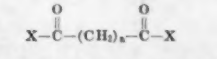
**Robert A. Lofquist, Richmond, Va., and Brendan T. Hayes, deceased, late of Chester, Va., by Barbara E. Hayes, administratrix, Chester, Va., assignors to Allied Chemical Corporation, New York, N.Y.**

**No Drawing. Filed Sept. 3, 1969, Ser. No. 855,469**

**Int. Cl. C08g** *41/04*

**U.S. Cl. 260—857 PEO** **4 Claims**

A filament, having antistatic properties, comprised of a hydrophobic synthetic polymer having mixed therethrough about 1 to 10 weight percent, based on the weight of the hydrophobic synthetic polymer, of the reaction product of a polyglycol which can be polyethylene glycol or a block copolymer of ethylene oxide and propylene oxide containing up to about 30 mole percent propylene oxide, said polyglycol having a molecular weight from about 100 to 15,000 and a compound which has the general formula:



wherein X is hydroxyl, —OR wherein R is lower alkyl, or halogen and *n* is an integer from 2 to about 20.

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3,655,822
**THERMOPLASTIC POLYMER ALLOY**

**James E. McGrath, Somerville, and Markus Matzner, Edison, N.J., assignors to Union Carbide Corporation, New York, N.Y.**

**No Drawing. Filed Oct. 12, 1970, Ser. No. 80,222**

**Int. Cl. C08g** *41/04, 22/00*

**U.S. Cl. 260—857 TW** **11 Claims**

An alloy of thermoplastic polymer is provided by a blend of (a) a polylactam-polyarylene polyether block copolymer and (b) polylactams and/or polyarylene polyethers.

3,655,823
**NOVEL MIXTURES OF ACRYLIC MONOMERS AND POLYESTER RESINS**

**Earl E. Parker, Allison Park, and Roger M. Christenson and Rostyslaw Dowbenko, Gibsonia, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.**

**No Drawing. Filed Nov. 6, 1969, Ser. No. 874,720**

**Int. Cl. C08f** *21/00, 21/02*

**U.S. Cl. 260—872** **7 Claims**

Novel mixtures of acryloxypivalyl acryloxypivalate and analogous compounds with polyesters are copolymerized by actinic light, free-radical catalysis or radiation curing. The resulting copolymer is a hard, mar-resistant, and relatively flexible material.

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3,655,824
**RUBBERY ACRYLIC RESIN COMPOSITION CONTAINING A RESINOUS 4,4'-DIOXY DIARYLALKANE POLYCARBONATE**

**Tetsuji Kato, Mikio Izumi, Yuji Hayashibara, and Kazuo Suenaga, Hiroshima, Japan, assignors to Mitsubishi Rayon Company, Ltd., Tokyo, Japan**

**No Drawing. Filed July 21, 1970, Ser. No. 56,943**

**Claims priority, application Japan, July 31, 1969, 44/59,964**

**Int. Cl. C08g** *39/10*

**U.S. Cl. 260—873** **13 Claims**

A resinous composition which comprises the admixture of: 5 to 95%, by weight of a resinous composition selected from the group consisting of a resinous polymer prepared by graft polymerizing 40–100% by weight of at least one monomeric vinyl aromatic hydrocarbon and 60–0%, by weight of an ethylenic comonomer, with a rubbery polymer formed from 50–100%, by weight of at least one monomer selected from the group consisting of alkyl acrylate and alkyl methacrylate, each containing between 1–18 carbon atoms in the alkyl group, and 50–0%, by weight, of an ethylenic comonomer, and a resinous polymeric mixture prepared by admixing a polymer formed by polymerizing from 40–100% by weight of at least one monomeric vinyl aromatic hydrocarbon and 60–0%, by weight of an ethylenic comonomer with a graft polymer prepared by graft polymerizing 40–100%, by weight of said monomeric vinyl aromatic hydrocarbons and 60–0%, by weight, of said ethylenic comonomer with a rubbery polymer formed from 50–100%, by weight of at least one monomer selected from the group consisting of alkyl acrylate and alkyl methacrylate, each containing between 1–18 carbon atoms in the alkyl group, and 50–0%, by weight of an ethylenic monomer, and 95–5%, by weight of a 4,4'-dioxy diarylalkane polycarbonate resin.

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3,655,825
**ACRYLIC IMPACT RESISTANT MODIFIERS FOR POLYVINYL CHLORIDE**

**Louis C. Souder, Levittown, Bjorn E. Larsson, Rushland, and Charles F. Ryan, Warminster, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.**

**No Drawing. Continuation of application Ser. No. 394,071, Sept. 2, 1964. This application Mar. 24, 1969, Ser. No. 810,016**

**Int. Cl. C08f** *37/18, 15/18*

**U.S. Cl. 260—876 R** **10 Claims**

This invention relates to solid, thermoplastic, polymeric products resulting from the polymerization of lower alkyl esters of acrylic and methacrylic acid. It also relates to high impact-resistant materials which result from blends of such products with other polymeric materials, particularly polymers and copolymers of vinyl chloride. The copolymers which are used in such blends typically comprise at least 80% by weight of a polyvinyl halide with up to 20% by weight of another monovinylidene compound copolymerizable therewith, such as vinyl acetate, methyl methacrylate, styrene, or the like.

3,655,826

## ACRYLIC ELASTOMER IMPACT MODIFIER

Robert Paul Fellmann, Wrightstown, and Robert Clarke Fettes, Feasterville, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

No Drawing. Continuation-in-part of application Ser. No. 734,541, June 5, 1968. This application May 8, 1969, Ser. No. 823,147

Int. Cl. C08f *29/24, 29/50, 33/08*

U.S. Cl. 260—876 R 14 Claims

Three-stage acrylic elastomer impact modifiers are provided. The polymers comprise a first stage of crosslinked polyacrylate rubber followed by a rigid styrene-type stage, followed in turn by a stage of rigid polymer chosen for compatibility in the polymer to be modified. The modifier is particularly useful as an impact strength improver, processing aid and/or heat distortion temperature improver in vinyl chloride polymers.

3,655,827

## POLYCHLOROPRENE SOL-GEL BLENDS

Joseph B. Finlay and John F. Hagman, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Feb. 28, 1969, Ser. No. 803,470

Int. Cl. C08d *9/16*

U.S. Cl. 260—890 6 Claims

Novel polychloroprene sol-gel elastomer blends, curable to elastomeric vulcanizates having improved tensile strength, are intimate mixtures of (a) a dialkyl xanthogen disulfide-modified, benzene-soluble polymer of chloroprene, the amount of dialkyl xanthogen disulfide being equivalent to about from 0.15 to 1 part of diethyl xanthogen disulfide per 100 parts of chloroprene monomer and the alkyl group having from 1 to 8 carbon atoms, and (b) a benzene-insoluble polymer of chloroprene, the proportion by weight of (a) to (b) being in the range from 20:1 to 1:1.

3,655,828

## PROCESS FOR PREPARING A POLYMER COMPOSITION HAVING IMPROVED GLOSS AND COLOR

George L. Rushton, Trenton, N.J., assignor to Cities Service Company, New York, N.Y.

No Drawing. Filed June 1, 1970, Ser. No. 42,567

Int. Cl. C08f *1/13, 15/04*

U.S. Cl. 260—880 R 6 Claims

A composition comprising a graft copolymer resin and the tetraalkali metal salt of ethylenediaminetetraacetic acid is characterized by improved color and gloss characteristics.

3,655,829

## MANUFACTURED ARTICLES OF BLENDS OF THERMOPLASTIC POLYMERS HAVING DIFFERENT FLUIDITY DEGREES

Isidoro Ronzoni, Camerlata, and Mario Catoni and Pier Lodovico Chini, Milan, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Filed Jan. 13, 1965, Ser. No. 425,320

Claims priority, application Italy, Jan. 14, 1964, 888/64

Int. Cl. C08f *29/24*

U.S. Cl. 260—899 14 Claims

Stippled surface thermoplastic articles are produced by extruding a mixture of a polymer of higher fluidity degree and one of lower fluidity degree at a temperature above the temperature of fluidization of the former but below the temperature of fluidization of the latter. Preferred polymers include polymethylmethacrylate, ABS type resins, and various copolymers of methylmethacrylate or of styrene.

3,655,830

## COMPATIBLE MIXTURES OF METHYL METHACRYLATE POLYMER AND HIGH MOLECULAR WEIGHT ETHYLENE OXIDE POLYMER

Terry Edward Smith, Norwalk, Conn., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Nov. 18, 1969, Ser. No. 877,876

Int. Cl. C08f *29/50, 37/18*

U.S. Cl. 260—901 4 Claims

Compositions of matter comprising polymers of methyl methacrylate having blended therewith from about 10% to about 30%, by weight, based on the total weight of the mixture, of a polymer of ethylene oxide having a molecular weight of at least about 50,000, are disclosed.

3,655,831

## PENTAERYTHRITOL DIPHOSPHITES

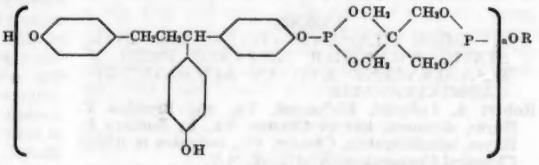
Lester Friedman, Beachwood, Ohio, assignor to Weston Chemical Corporation, New York, N.Y.

No Drawing. Original application July 22, 1968, Ser. No. 746,239, now Patent No. 3,516,963, dated June 23, 1970. Divided and this application Sept. 11, 1969, Ser. No. 870,810

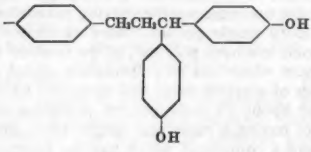
Int. Cl. C07d *105/04;* C08f *45/58*

U.S. Cl. 260—927 R 12 Claims

Compounds are prepared having the formula



where R is alkyl, alkenyl, aryl, aralkyl, haloaryl, haloalkyl or



and *n* is an integer of at least 1 and can be 100 or more. The compounds are useful as stabilizers.

3,655,832

## POLYCARBOCYCLIC PHENOLIC PHOSPHITES

Otto S. Kauder, Jamaica, William E. Leistner, Brooklyn, and Arthur C. Hecker, Forest Hills, N.Y., assignors to Argus Chemical Corporation, Brooklyn, N.Y.

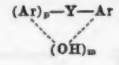
No Drawing. Continuation-in-part of applications Ser. No. 160,237, Dec. 18, 1961, and Ser. No. 240,754, Nov. 28, 1962, and a division of application Ser. No. 569,115, Aug. 1, 1966, now Patent No. 3,476,699. This application Feb. 18, 1969, Ser. No. 871,178

Int. Cl. C07d *105/04;* C07f *9/12*

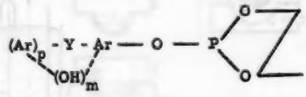
U.S. Cl. 260—930 15 Claims

Organic phosphites are provided having in the molecule at least one polycarbocyclic phenolic group for each phosphite group, such polycarbocyclic phenolic group

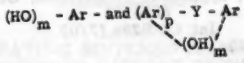
having from one to about thirty carbon atoms per phenolic group, and having the formula:



and the phosphite having at least one aliphatic and/or cycloaliphatic group and having the formula:



wherein Ar is a carbocyclic aromatic nucleus and at least one Ar nucleus has a phenolic hydroxyl group, *m* has a value from one to about five; *p* has a value from two to four; and Z is taken in sufficient number to satisfy the valences of the two phosphite oxygen atoms, includes at least one aliphatic or cycloaliphatic group; and is selected from the group consisting of hydrogen; monovalent and bivalent aliphatic, aromatic, and cycloaliphatic hydrocarbon radicals having from about one to about thirty carbon atoms; and monovalent and bivalent phenolic groups having from one to about thirty carbon atoms per phenolic hydroxyl group, and selected from the group consisting of



which in polymeric phosphites are linked to additional phosphite groups, such phosphites containing at least one aliphatic or cycloaliphatic group for each one to ten phosphite groups; and Y is a linking nucleus selected from the group consisting of trivalent, tetravalent and pentavalent aliphatic, cycloaliphatic, and aromatic hydrocarbon groups, attached to each Ar group through a carbon atom not a member of an aromatic ring, and such aliphatic radicals including carboxylic acid ester groups, and having from one to about thirty-three carbon atoms.

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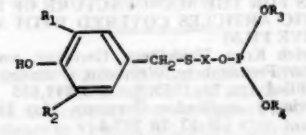
**3,655,833**

## REACTION PRODUCTS OF PHENOL DERIVATIVES WITH PHOSPHOROUS COMPOUNDS

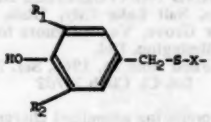
**Heinz Eggensperger, Bensheim, Volker Franzen, Heidelberg, and Hans Stephan, Bensheim, Bergstrasse, Germany, assignors to Deutsche Advance Produktion G.m.b.H., Lautern, Odenwald, Germany**

**No Drawing. Filed July 30, 1968, Ser. No. 748,619**
**Claims priority, application Germany, Aug. 12, 1967, P 16 43 880.5**
**Int. Cl. C07f *9/08***
**U.S. Cl. 260—948** **8 Claims**

Novel compounds having the formula:



wherein $R_1$ is selected from the group consisting of hydrogen and alkyl radicals having 1 to 6 carbon atoms, $R_2$ is an alkyl radical having 1 to 6 carbon atoms, X is selected from the group consisting of alkylene radicals having 1 to 6 carbon atoms and carboxyl substituted alkyl radicals having 1 to 6 carbon atoms, and $R_3$ and $R_4$ are selected from the group consisting of alkyl, aryl, alkaryl, arylalkyl and



wherein $R_1$, $R_2$ and X are as defined above are useful as stabilizers for polymeric compositions.

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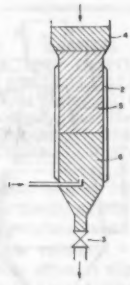
**3,655,834**

## LOWERING THE MOLECULAR WEIGHT OF HIGH MOLECULAR WEIGHT POLYETHYLENE IN THE POWDER PHASE

**Karl Wisseroth, Ludwigshafen, and Richard Scholl, Nordring, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany**

**Filed Nov. 13, 1969, Ser. No. 876,332**
**Int. Cl. C08f *3/06, 27/22, 27/26***
**U.S. Cl. 260—94.9 GC** **5 Claims**



Lowering the molecular weight of high molecular weight polyethylene by swelling particles of polyethylene with an organic solvent and heating the particles in an oxygen atmosphere at elevated temperature. Polyethylene thus obtained is more easily processed in extruders.

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**3,655,835**

## PROCESS FOR THE PREPARATION OF DIMETHYL-THIOPHOSPHITE OR OF ORGANOTHIOPHOSPHONOUS ACID O-MONOMETHYL ESTER

**Reinhard Schliebs, Cologne, Flittard, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany**

**No Drawing. Filed May 5, 1969, Ser. No. 821,995**
**Claims priority, application Germany, May 20, 1968, P 17 68 503.9**
**Int. Cl. C07f *9/16***
**U.S. Cl. 260—983** **15 Claims**

Reacting trimethylposphite or organo-phosphonous acid O,O-dimethyl ester with hydrogen sulfide in the presence of a weak organic base (the pKa of which in aqueous solution is about 0.5–8) at a temperature of substantially between about 0–70° C. and a starting pressure of substantially between about 1–65 atmospheres absolute, to form in high yield and purity the corresponding known dimethyl-thiophosphite or organo-thiophosphonous acid-O-mono methyl ester, which are known intermediates useable for the synthesis of known biocidal, especially insecticidal, phosphoric acid esters.

3,655,836

## PROCESS FOR PREPARATION OF MOLDED PROPELLANT CHARGES FROM SMOKELESS POWDER AND NONVOLATILE BINDERS

Henry C. Dehm, Salt Lake City, Utah, and Dale F. Mellow, Sugar Grove, Va., assignors to Hercules Incorporated, Wilmington, Del.

No Drawing. Filed June 26, 1968, Ser. No. 740,074
Int. Cl. C06b 21/02
U.S. Cl. 264—3 14 Claims

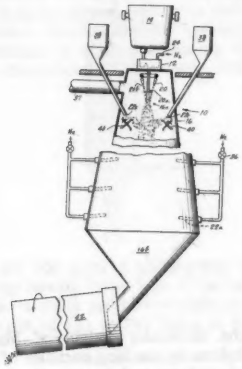
A method for preparing propellant charges from smokeless powder and nonvolatile binders boiling above about 200° C. is provided. The smokeless powder granules and nonvolatile binders are consolidated into the propellant charge by molding. The consolidated propellant charge is dimensionally stable and burns as a granular charge.

3,655,837

## PROCESS FOR PRODUCING METAL POWDER

William A. Reed, West Richfield, William K. Kinzer, Northfield Center, John J, Swanson, Lakewood, and Robert E. Kusner, Brecksville, Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Filed June 18, 1969, Ser. No. 834,368
Int. Cl. B22f 9/00
U.S. Cl. 264—6 16 Claims



Process for producing metal particles having irregular shapes involving atomizing a flowing stream of molten metal to produce particles, and injecting particles of metal of the same material as the molten metal into the zone of atomization or prior to or subsequent to atomization, or injecting an inert gas substantially against the flow of particles downstream from the zone of atomization.

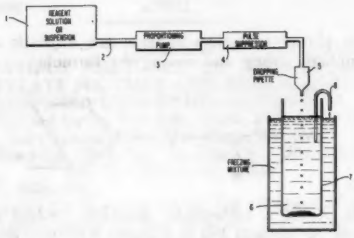
3,655,838

## METHOD OF PELLETIZING ANALYTICAL OR IMMUNOLOGICAL REAGENTS

Richard Thompson Price, Verona, and Stuart Michael Bauer, Parsippany, N.J., John Brownlee, West Seneca, N.Y., and Bastiaan Cornelis Goverde, Oss, Netherlands, assignors to Organon, Inc., West Orange, N.J.

Filed Mar. 20, 1969, Ser. No. 808,803
Int. Cl. B01j 2/06
U.S. Cl. 264—13 7 Claims

Pelletized analytical and immunological reagents are prepared in a stable accurate form containing predetermined and pretested measured amounts of substances capable of participating in analytical and immunological reactions, such as pregnancy tests, by forming these reagents into frozen and freeze-dried beads or spheres; a set of these pellets comprising an antiserum and an antigen is placed in a test vessel and moistened with the liquid to



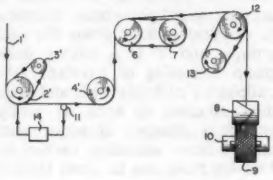
be tested and then allowed to stand until agglutination or precipitin reaction does or does not occur.

3,655,839

## MANUFACTURE OF DRAWN THERMOPLASTIC FIBRILLARY PRODUCTS

Hendrinus Sempel and Hendrik Potman, Arnhem, Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Filed Oct. 2, 1969, Ser. No. 863,180
Claims priority, application Netherlands, Oct. 8, 1968, 6814352
Int. Cl. B29c 17/02
U.S. Cl. 264—40 2 Claims



A process for drawing a thermoplastic fibrillary product which comprises the steps of feeding the fibrillary product to a drawing zone; drawing the product in the drawing zone, there being a maximum change in the denier of the product at the drawing point in the drawing zone; passing the fibrillary product in slipping contact over at least one friction member after the drawing point and in the drawing zone; and thereafter discharging the product from the drawing zone. Also apparatus for carrying out the process and the drawn product are disclosed.

3,655,840

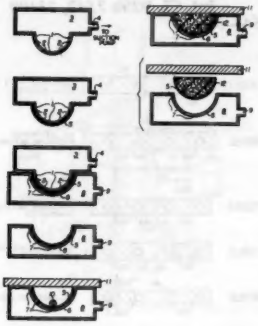
## PROCESS FOR THE MANUFACTURE OF FOAM-PLASTIC ARTICLES COVERED WITH A PROTECTIVE FILM

Hans-Dietrich Krug, Heidelberg, Germany, assignor to Carl Freudenberg, Weinheim, Germany

Filed Apr. 28, 1969, Ser. No. 819,855
Claims priority, application Germany, May 28, 1968, P 17 78 717.6
Int. Cl. B29d 9/00, 9/08
U.S. Cl. 264—45 5 Claims

The improvements in the production of foam-form articles having a film-form member on at least one surface thereof by placing the film-form member in a suitable female mold and permitting foamable material to foam on the film-form member within the mold, whereby

filling out the mold and adhering to the film-form material; wherein the film-form material is initially disposed on a male mold form corresponding to the female mold



form and is transferred from the male mold form to the female mold form in the desired mold shape, and thereafter the foamable material is permitted to foam on the film-form member within the female mold form.

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**3,655,841**

**HEAT TREATING SINTERED MANGANESE-ZINC FERRITES TO IMPROVE PROPERTIES**

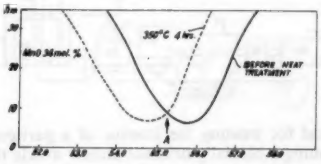
**Tsuneo Akashi, Izuru Sugano, Taneaki Okuda, Yoshihiro Onodo, and Toshiro Tsuji, Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan**

**Continuation-in-part of application Ser. No. 762,403, Sept. 25, 1968. This application Oct. 7, 1970, Ser. No. 78,808**

**Claims priority, application Japan, Sept. 26, 1967, 42/62,961**

**Int. Cl. C04b** *35/26, 35/36, 35/38*

**U.S. Cl. 264—66** **6 Claims**




The properties of manganese-zinc ferrites are improved by subjecting previously sintered ferrites to a low-temperature heat treatment at temperatures ranging up to about 400° C. The actual temperatures used are determined by the iron oxide content of the ferrite.

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**3,655,842**

**METHOD OF VIBRATING CORE IN CONCRETE PIPE MAKING MACHINE**

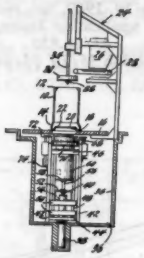
**Ferdinand A. Trautner, Newton Upper Falls, Mass., assignor to Viropac, Inc., Sioux City, Iowa**

**Original application May 27, 1967, Ser. No. 638,010. Divided and this application Oct. 17, 1969, Ser. No. 3,264**

**Int. Cl. B28b** *1/46, 7/00, 21/00*

**U.S. Cl. 264—72** **9 Claims**

The invention comprises a novel method of vibrating a core in a concrete pipe making machine. In a preferred embodiment, a novel core is inserted and vibrated simultaneously with formation of the cementitious pipe. Vibration may continue for a short period after pipe formation in order to insure complete compaction of material and elimination of voids.



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**3,655,843**

**MANUFACTURE OF DISPOSABLE CERAMIC DISHES FROM HIGH ALKALI PYROPHYLLITE**

**Fred G. Simmen, East Liverpool, Ohio, assignor to Hall China Company, East Liverpool, Ohio**

**No Drawing. Filed Oct. 27, 1969, Ser. No. 869,896**

**Int. Cl. C04b** *33/24, 33/28, 33/34*

**U.S. Cl. 264—59** **7 Claims**

Thin walled ceramic articles for single-use, or throw-away type, that are tough, strong and capable of rapid heating in high temperature ovens are made by applying to a heat-consumable substrate a thin layer of a low density, high viscosity aqueous slip consisting essentially of white ware grade pyrophyllite that is resistant to wetting and undergoes zero, or substantially zero, shrinkage on drying, drying the deposited slip layer on the substrate, applying glaze to the upper dried surface, and firing to mature the article and glaze and ash or otherwise consume the substrate.

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**3,655,844**

**PROCESS FOR THE MANUFACTURE OF SHAPED STRUCTURES WITH IMPROVED DYE AFFINITY**

**Hans Hoyer, Frankfurt am Main, Gunter Keil, Lorsbach, Taunus, and Wilhelm Happe, Schwalbach, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany**

**No Drawing. Continuation-in-part of application Ser. No. 619,183, Mar. 28, 1967. This application Nov. 18, 1969, Ser. No. 877,816**

**Claims priority, application Germany, Mar. 16, 1966, F 48,665**

**Int. Cl. B29c** *25/00;* **C08g** *17/00;* **D06m** *5/06*

**U.S. Cl. 264—78** **5 Claims**

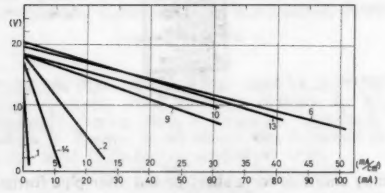
In the manufacture of copolyesters from terephthalic acid or the low molecular weight alkyl esters thereof and ethylene glycol, definite mercaptals and/or thioketals are incorporated into the macromolecule by ester linkage. The polyesters are shaped from the melt and sulfonic acid groups are produced in the shaped structures by an oxidative after-treatment. The structures have a high affinity for cationic substances.

3,655,845

## HEATING A SINTERED ALUMINA ARTICLE IN ATMOSPHERE CONTAINING SODIUM OR POTASSIUM IONS

Takewo Chiku, Toyota-shi, Japan, assignor to Kabushiki Kaisha Toyota Chuo Kenkyusho, Nagoya-shi, Aichiken, Japan

Filed July 29, 1969, Ser. No. 845,694
Claims priority, application Japan, Aug. 10, 1968, 43/56,831
Int. Cl. C04b *35/10, 35/64, 41/02*
U.S. Cl. 264—82 10 Claims



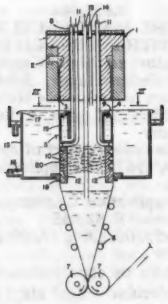

A method for producing a permeable product of the beta-alumina type capable of passing sodium and/or potassium ions and primarily useful as the separator in a battery cell, comprising the steps of forming an alpha-alumina sintered member into a desired shape, placing said sintered member in an alkali metal atmosphere, e.g., sodium potassium, or oxides thereof at an elevated temperature, and diffusing the alkali metal or its oxide into said alpha-alumina member, whereby to form an ion permeable separator having a dense structure and sufficient strength for its intended use.

3,655,846

## METHOD AND APPARATUS FOR MAKING TUBULAR FILM

Teruchika Kanoh and Ryota Notomi, Shizuoka-ken, Japan, assignors to Kohjin Company, Limited, Tokyo, Japan

Filed Apr. 28, 1969, Ser. No. 819,928
Int. Cl. B29d *23/04*
U.S. Cl. 264—89 7 Claims



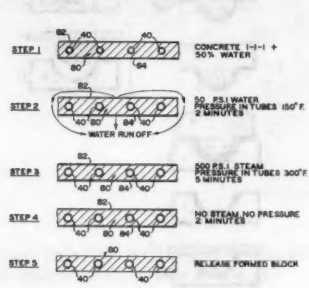
Manufacture of continuous tubular films of thermoplastic materials in which a molten tubular film of thermoplastic material is rapidly cooled with liquids concomitantly along its inside and outside surfaces.

3,655,847

## METHOD FOR FORMING CONCRETE PANELS UNDER COMPRESSION

Burton D. Morgan, 302 Aurora St., Hudson, Ohio 44236

Filed Feb. 19, 1969, Ser. No. 800,418
Int. Cl. B29b *7/32, 23/00*
U.S. Cl. 264—94 2 Claims


STEP 1
CONCRETE 1-1-1 + 50% WATER
STEP 2
50 P.S.I. WATER PRESSURE IN TUBES 150° F. 2 MINUTES
WATER RUN OFF
STEP 3
300 P.S.I. STEAM PRESSURE IN TUBES 300° F. 5 MINUTES
STEP 4
NO STEAM NO PRESSURE 2 MINUTES
STEP 5
RELEASE FORMED BLOCK

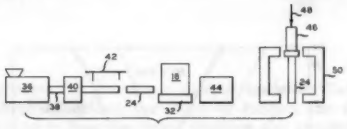
The invention relates to a method particularly adapted for forming concrete panels under pressure which essentially comprises positioning an expandable tube within the concrete to be formed and heating and pressurizing the tube into expansion while retaining or maintaining a uniform cavity size during the forming operation whereby internal pressure is thus exerted onto the formed concrete by the pressurization of the expandable tube to increase density and structural strength while lowering curing time of the concrete panels so formed.

3,655,848

## SURFACE TREATMENT OF INTERIOR OF PARISON PREFORM

Richard K. Young and Calvin D. Dockery, Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed Aug. 18, 1969, Ser. No. 850,783
Int. Cl. B29c *17/07, 17/14*
U.S. Cl. 264—98 7 Claims




Method for treating the interior of a parison preform and forming a biaxially oriented hollow article therefrom. Parison preforms are formed by extruding olefin polymer in tube form and cutting the tube into individual preforms. The interior of each preform is heat treated to melt the interior surface thereof to a depth of 0.1 to 15 mils and is then quenched. The treated parison is then reheated to the orientation temperature, stretched longitudinally, placed in a mold and blown to the shape of the mold.

3,655,849

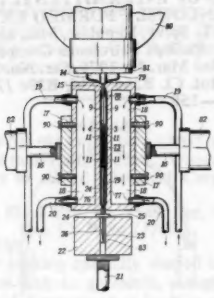
## MANUFACTURING OF SUN VISORS OR GLARE SHIELDS FOR MOTOR VEHICLES

Isao Hayashi, Nagoya, Japan, assignor to Hayashi Telempu Co., Ltd., Nagoya, Japan

Filed Nov. 12, 1969, Ser. No. 876,149
Claims priority, application Japan, Nov. 15, 1968, 43/83,645
Int. Cl. B29c *17/07*
U.S. Cl. 264—98 5 Claims

The present invention relates to a new method of manufacturing of sun visors or glare shields to be fitted inside

motor vehicles, forming a hollow shell construction with synthetic resin, disposing simultaneously a bearing member therein which is to engage with a supporting rod and



to be locked in eyelet shape to the concave portions formed at a desired interior portions of the shell as parts thereof.

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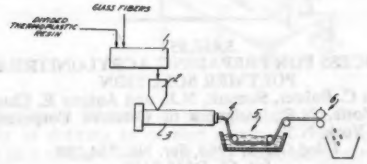
**3,655,850**

## METHOD FOR THE CONTINUOUS PRODUCTION OF GLASS FIBER REINFORCED THERMOPLASTICS

**George W. Woodham, Evansville, and James L. Stuart, Boonville, Ind., assignors to Dart Industries, Inc., Los Angeles, Calif.**

**Filed Oct. 30, 1969, Ser. No. 872,683**
**Int. Cl. B01j** *2/20*
**U.S. Cl. 264—118** **10 Claims**



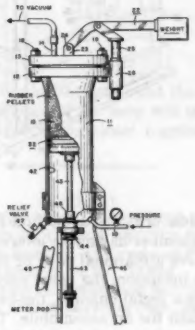

A process disclosed for continuously producing glass fiber reinforced thermoplastic compositions by extrusion techniques whereby surging is minimized or substantially eliminated and products having good appearance and uniformity may be obtained. A blended mixture of glass fibers and thermoplastic resin in divided form are fed and processed through an extruder equipped with a multiflight screw which provides for two stages, each stage including a feed zone, transition zone and metering zone and wherein the compression ratio in the first stage is in the range of about 3:1 to 5:1, the compression ratio in the second stage is in the range of about 1.5:1 to about 3.5:1, and the ratio between the flight depth of the screw in the second stage feed zone and the flight depth of the screw in the first stage feed zone is in the range of about 1:1.25 to about 1:2.5. The mixture is continuously extruded under the above conditions, coled to solidification, and subdivided into the desired size. The resulting compositions are particularly suitable for molding operations.

**3,655,851**

## METHOD FOR BALING PARTICULATE SYNTHETIC ELASTOMER

**Marcus H. Shelton, Baytown, and Ralph James, Jr., Channelview, Tex., assignors to Esso Research and Engineering Company**

**Continuation-in-part of application Ser. No. 692,436, Dec. 21, 1967. This application Mar. 19, 1970, Ser. No. 21,005**
**The portion of the term of the patent subsequent to Sept. 1, 1987, has been disclaimed**
**Int. Cl. B27h** *3/00, 31/00*
**U.S. Cl. 264—102** **7 Claims**




A method for baling particulate synthetic elastomers such as butyl rubber and polyisobutylene. The particulate elastomer is placed in a chamber and subjected to a reduced pressure in order to remove vaporizable material and gasiform material. The elastomer is then subjected to a relatively low mechanical pressure to achieve a high density body. Densities as high as 90 to 95 percent of the maximum achievable densities for these materials are obtained and the compressed bodies show substantially no cold flow or deformity.

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**3,655,852**

## METHOD OF FORMING A STABLE VITAMIN E–C GRANULATION

**Arnold Koff, West Orange, and Louis Magid, Clifton, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.**

**No Drawing. Filed Aug. 1, 1969, Ser. No. 846,921**
**Int. Cl. B01j** *2/20*
**U.S. Cl. 264—115** **2 Claims**

A method of forming a granulation of vitamins E and C which can be formed into multivitamin tablets by direct compression is described. Multivitamin tablets containing a high potency of vitamin E in the form of the granulations produced by the method of the invention are stable against oil bleeding and cracking.

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**3,655,853**

## PROCESS FOR PRODUCING POLYTETRAFLUOROETHYLENE FILAMENTS

**Arthur R. Gallup, Bon Air, Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**No Drawing. Filed Aug. 10, 1970, Ser. No. 62,627**
**Int. Cl. B27j** *5/00*
**U.S. Cl. 264—127** **4 Claims**

Polytetrafluoroethylene filaments of improved strength are produced by extruding a mixture of viscose and PTFE aqueous dispersion having an average particle size of from 0.1 to 0.17 micron into an acidic coagulating and regenerating bath.

3,655,854

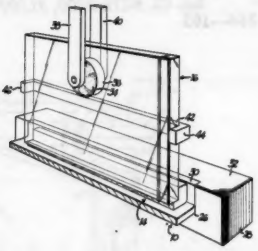
## METHOD FOR BEDDING PANELS INTO FRAMES

Robert J. Deisenroth, Elkhart, Ind., assignor to Excel Corporation, Elkhart, Ind.

Continuation-in-part of application Ser. No. 789,714, Jan. 8, 1969, which is a continuation-in-part of application Ser. No. 531,242, Mar. 2, 1966. This application Sept. 8, 1970, Ser. No. 70,570

Int. Cl. B32b *31/12, 31/26*

U.S. Cl. 264—134 1 Claim



The invention provides a method for bedding a panel into a frame member having an interior surface forming a recess to receive a marginal edge of the panel. In accordance with the invention, the panel may be a glass member and the frame a metal channel, the two elements forming the window sash for an automobile. The method includes the step of forming a solid, rigid body of thermoplastic resinous bedding material having an interior surface forming a recess. The body is dimensioned to fit into the frame member and to receive the marginal edge of the panel in the recess of the body. A heat curable thermosetting resinous material is coated over the entire surface of the solid body and the thus coated body is placed in the recess of the frame member. A marginal edge of the panel is then placed within the recess of the solid body and in contact with the curable resinous material. The solid body is then heated to cure the uncured resinous thermosetting material and make plastic the solid body to wet the members and provide good adherence of the solid body to both the panel and the frame member. The assembly is then cooled to a solid condition.

3,655,855

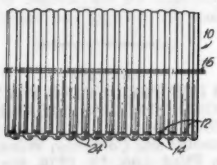
## METHOD OF PRODUCING A SELF-GRIPPING FASTENING FILAMENT

George C. Brumlik, 154 Upper Mountain Ave., Montclair, N.J. 07042

Original application Mar. 6, 1968, Ser. No. 710,972, now Patent No. 3,522,637, dated Aug. 4, 1970. Divided and this application May 8, 1970, Ser. No. 35,817

Int. Cl. B29h *7/18*

U.S. Cl. 264—147 5 Claims



A method is provided to produce a self-gripping fastener device which device is integrally made as part of a thread or filament. A sheet of plastic is extruded having the profile of a series of hooks extending therefrom spatially staggered along the length of the sheet. The sheet is then cut into thin sections to form threads or filaments. The device is then employed either as a filament or as a yarn to form a fabric, felted surface or the like, the latter being releasably self-adhering by the application of pressure therein.

3,655,856

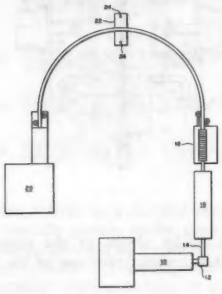
## METHOD OF INTERMITTENTLY SEVERING CONTINUOUSLY FORMED EXTRUDATE

Paul L. Spivy, Republic, Mo., assignor to Phillips Petroleum Company

Filed Mar. 12, 1970, Ser. No. 18,959

Int. Cl. B26d *3/16;* B29c *17/14*

U.S. Cl. 264—150 7 Claims



A continuous extrudate is bent through an arc prior to entry into a cutter unit. As the tubing in the cutter unit is held in a fixed position, the continuing extrusion of the extrudate results in increasing the size of the arc. Two limit switches are provided, one positioned so that as the size of the arc is increased to a preset amount, the tubing will touch same and thereby cause the cutting mechanism to advance the tubing, thus decreasing the size of the arc until it contacts the second limit switch which stops the movement of the material into the cutter. Thereafter, the portion of the extrudate advanced into the cutter is held in a stationary position and cut while the extrusion continues.

3,655,857

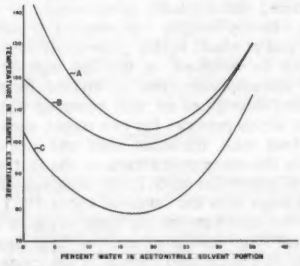
## PROCESS FOR PREPARING ACRYLONITRILE POLYMER SOLUTION

Thomas C. Bohrer, Summit, N.J., and Antony E. Champ, Charlotte, N.C., assignors to Celanese Corporation, New York, N.Y.

Filed Oct. 2, 1968, Ser. No. 764,380

Int. Cl. D01f *7/00*

U.S. Cl. 264—206 11 Claims




A method for forming shaped articles, such as fibers, films, fibrillated films, molded products and the like, is described utilizing a solution of an acrylonitrile polymer in a low boiling solvent maintained under superatmospheric

pressures. The products produced thereby are unique and, when in fiber form, the fibers possess particularly desirable properties. The process is directed to the extruding of acrylonitrile polymers at least about 85 percent acrylonitrile using acetonitrile as the solvent. The process is effected by maintaining the fiber-forming material in a liquid state under superatmospheric pressure and elevated temperatures and releasing the pressure and/or cooling on extruding through a shaped orifice. The process conditions are readily varied so that melt spun, dry spun or wet spun type results are obtained.

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**3,655,858**

## PROCESS FOR SHAPING FABRIC ARTICLES

**Robert C. Wincklhofer and Gene C. Weedon, Richmond, Va., assignors to Allied Chemical Corporation, New York, N.Y.**

**No Drawing. Filed Feb. 24, 1969, Ser. No. 801,836**
**Int. Cl. B29c** *13/00*
**U.S. Cl. 264—230** **8 Claims**

A process for making specially shaped textile material or fabric articles such as garments, comprising the step of adapting a fabric composed at least in part of a novel fiber forming material containing at least two polymeric ingredients of differing melting points, and heating the fabric to shrink fit on said mold.

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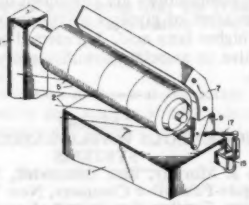
**3,655,859**

## PROCESS FOR PREPARING CONJUGATE FILAMENTS

**Jack M. Buchanan, Parkwood, N.C., assignor to Hercules Incorporated, Wilmington, Del.**

**Filed July 8, 1970, Ser. No. 53,048**
**Int. Cl. B29c** *25/00;* **D01d** *5/22*
**U.S. Cl. 264—234** **1 Claim**



Conjugate filaments of polypropylene are heat treated prior to drawing to develop maximum crimping potential in a reduced time. The heat treatment is carried out by focusing radiant heaters on the undrawn yarn package as it is being wound. The heaters are maintained at a constant distance from the yarn package and a temperature of 120 to 200° C. is maintained in the space between the heaters and the yarn package.

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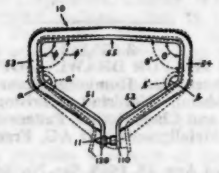
**3,655,860**

## METHOD FOR CONSTRUCTING HANDLE OF THERMOPLASTIC MATERIAL

**Leigh D. Leiter, Philadelphia, Pa., and Frank R. Linda, Bridgeport, Conn., assignors to International Paper Company, New York, N.Y.**

**Division of application Ser. No. 712,993, Mar. 14, 1968, now Patent No. 3,481,528, and a continuation-in-part of applications Ser. No. 521,362, Jan. 18, 1966, now Patent No. 3,373,924, and Ser. No. 565,045, July 6, 1966. Divided and this application June 23, 1969, Ser. No. 858,218**
**Int. Cl. B29f** *3/08;* **B29c** *25/00*
**U.S. Cl. 264—237** **3 Claims**

A method for constructing a handle of thermoplastic material by forming the material at an elevated temperature into an open loop having a plurality of co-planar sides and a cross-section in the shape of an inverted "T," and by cooling the loop essentially free of restraint on the movement of the sides of the loop so that as the loop cools the sides of the loop will tend to bow concavely



relative to the interior of the loop, and the corner angles between contiguous sides of the loop will tend to become more acute, thereby bringing closer together the ends of the loop.

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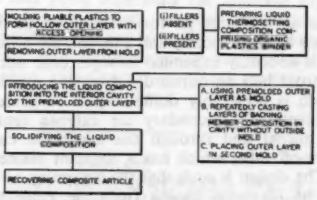
**3,655,861**

## METHOD FOR THE MANUFACTURE OF MOLDED SOLID PLASTICS ARTICLES

**Arthur H. Roberts, 12 Lynwood Drive, Westbury, N.Y. 11590**

**Continuation-in-part of application Ser. No. 475,989, July 30, 1965. This application Nov. 29, 1968, Ser. No. 779,837**
**The portion of the term of the patent subsequent to Oct. 7, 1985, has been disclaimed**
**Int. Cl. B29c** *13/04*
**U.S. Cl. 264—250** **18 Claims**


MOLDING PLIABLE PLASTICS TO FORM HOLLOW OUTER LAYER WITH ACCESS OPENING
REMOVING OUTER LAYER FROM MOLD
INTRODUCING THE LIQUID COMPOSITION INTO THE INTERIOR CAVITY OF THE PREMOLDED OUTER LAYER
SOLIDIFYING THE LIQUID COMPOSITION
RECOVERING COMPOSITE ARTICLE
(1) FILLERS ABSENT
(2) FILLERS PRESENT
PREPARING LIQUID THERMOSETTING COMPOSITION COMPRISING ORGANIC PLASTICS BINDER
A. USING PREMOLDED OUTER LAYER AS MOLD
B. REPEATEDLY CASTING LAYERS OF BACKING MEMBER COMPOSITION IN CAVITY WITHOUT OUTSIDE MOLD
C. PLACING OUTER LAYER IN SECOND MOLD

This invention relates to the preparation of composite articles of manufacture and to the articles so produced. The articles are impact-resistant, three-dimensional and rigid. The articles are comprised of two essential elements: (1) A pliable, hollow premolded outer plastics layer and (2) an essentially rigid non-cellular organic plastics structural backing member solidified in the hollow interior of the plastics skin, and essentially solidly filling said hollow interior. The hollow outer layer is prepared in a manner to have an access opening to its hollow interior. A liquid plastics composition is next prepared in a separate step that comprises an organic binder which solidifies at room temperature, in most cases by converting to a thermoset stage. This liquid composition is then introduced through the access opening into the cavity of the premolded outer layer. The liquid composition is then solidified in a manner to fill essentially voidlessly and fully the cavity of the outer layer, thus producing a dense tough integral article of manufacture having the shape of the premolded outer layer. Illustrative for the outer layer materials are plasticized polyvinylchloride compositions, polyethylene and rubbers. Illustrative for the interior component are epoxy resins, polyester resins,

room temperature curing phenolics and filler containing polysulfide rubber, repolymerized depolymerized rubber and polyurethanes. Fillers may be present in the liquid compositions. By the favored method decorative and utilitarian articles with complicated undercuts can be prepared in a simple and economic manner.

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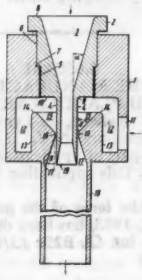
3,655,862

## ASPIRATOR JET FOR DRAWING-OFF FILAMENTS

Oskar Dorschner, Bad Homburg, Franz Josef Carduck, Bergen-Enkheim, Nordring, Christoph Storkebaum, Egelsbach, and Claus Rother, Petterweil, Germany, assignors to Metallgesellschaft AG, Frankfurt am Main, Germany

Filed Aug. 15, 1969, Ser. No. 850,500
Claims priority, application Germany, Aug. 17, 1968, P 17 85 158.0
Int. Cl. B29c *17/02*
U.S. Cl. 264—290 11 Claims



In an aspirator jet for drawing-off thermoplastic filaments having a nozzle and a throat, the primary aspirating air is smoothly expanded to supersonic velocities through a throat into an outwardly diverging expansion chamber which is preferably dome-shaped. A guide tube for the filaments and secondary air extends centrally through the throat and through the expansion chamber to the draw-off tube, which has a constant diameter.

The design is such that the aspirating air flows parallel to the filaments issuing from the guide tube and does not impinge thereon as is the case with the jet designs of the prior art.

This design permits draw-off of filaments at high speeds, in excess of 2,000 meters/min., with good separation and substantially complete parallelism between the filaments and without intermingling or twisting and interlocking of the filaments.

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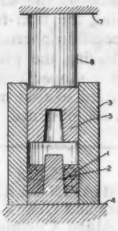
3,655,863

## METHOD OF MAKING A CONTOURED COMPOSITE PRODUCT

Harry M. Andersen, Ballwin, David C. Morris, St. Louis, and Tommy L. Tolbert, Chesterfield, Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of application Ser. No. 677,629, Oct. 24, 1967. This application Jan. 9, 1970, Ser. No. 3,574
Int. Cl. B29c *3/00*; B29d *3/02*
U.S. Cl. 264—294 4 Claims

A method of producing a compression molded, contoured composite structure with an epoxide resin matrix having dispersed therein a plurality of discontinuous, reinforcing, inorganic fibers substantially in parallel arrangement with respect to each other. A contoured mold surface is covered with an elongated, formed body of B staged epoxide resin having said fibers included therein, lengthwise and in parallel, along the length of the body. The body is positioned on said surface so as



to obtain maximum parallel disposition of the fibers, with respect to each other, throughout the area, and the assembly is compression molded.

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3,655,864

## GLYCERYL TRISTERATE AND HIGHER FATTY ACID MIXTURE FOR IMPROVING DIGESTIVE ABSORPTION

George M. Grass, Jr., Phoenixville, and Raymond R. Unangst, Havertown, Pa., assignors to Smith Kline & French Laboratories, Philadelphia, Pa.

No Drawing. Filed Sept. 21, 1970, Ser. No. 74,138
Int. Cl. A61k *27/00*
U.S. Cl. 424—38 7 Claims

Veterinary compositions permitting passage of biologically active feed additives through the rumen substantially unchanged resulting in release and absorption postruminally. The compositions are embedded in or coated by an intimate mixture of glyceryl tristearate with a liquid unsaturated higher fatty acid. A preferred composition is the feed additive in association with glyceryl tristearate and oleic acid.

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3,655,865

## HOMOGENEOUS WATER-BASED AEROSOL SYSTEMS

Lawrence J. Murphy, East Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 527,516, Feb. 15, 1966. This application June 8, 1970, Ser. No. 44,627
Int. Cl. A61k *7/06*
U.S. Cl. 424—45 5 Claims

Homogeneous water-based aerosol systems containing minor amounts of siloxane-polyoxyalkylene copolymer, surfactant, and propellant and major amount of water. This combination results in clear aerosol compositions which have sufficient propellant for satisfactory exhaustion from an aerosol container. The propellants do not layer out and are not emulsified but are completely dissolved by the aqueous concentrate forming a homogeneous system.

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3,655,866

## SUGARLESS GUM CONTAINING DICALCIUM PHOSPHATE DIHYDRATE

Anthony C. Bilotti, Queens Village, N.Y., assignor to Warner-Lambert Company, Morris Plains, N.J.

No Drawing. Filed Jan. 26, 1970, Ser. No. 5,967
Int. Cl. A61k *27/00*
U.S. Cl. 424—48 4 Claims

A sugarless gum containing a freely releasable form of dicalcium phosphate dihydrate is prepared by coating or agglomerating dicalcium phosphate dihydrate powder with a water-soluble polyol or combination of polyols, such as mannitol, sorbitol, xylitol, or arabitol, prior to

incorporation into the gum composition. About 0.5 to 18 parts by weight of the polyol ingredient is mixed with 1 part by weight of dicalcium phosphate dihydrate powder and a small amount of water is added; the agglomerate formed is dried, pulverized and incorporated into a sugarless gum composition prepared from gum base, sorbitol solution, sorbitol, mannitol, artificial sweeteners, and flavoring agents. This chewing gum product provides a method for reducing the incidence of dental caries since therapeutically beneficial quantities of dicalcium phosphate dihydrate are freely released into the oral cavity and brought into contact with the dental enamel upon chewing of the gum.

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**3,655,867**

**DENTAL PREPARATIONS**

**Ludwig Schoernig, Frankfurt am Main, Germany, assignor to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany**

**No Drawing. Continuation-in-part of application Ser. No. 601,312, Dec. 13, 1966. This application May 1, 1970, Ser. No. 33,916**

**Int. Cl. A61k** *7/16*

**U.S. Cl. 424—52** **1 Claim**

Dental preparation containing a fluoride and a polishing abrasive agent, a mixture of magnesium ammonium phosphate and calcium hydrogen phosphate.

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**3,655,868**

**ORAL DEODORANT**

**Harold N. Vagenius, Berwyn, Ill.; Helen M. Vagenius, administrator with the will annexed of the estate of said Harold N. Vagenius, deceased**

**No Drawing. Original application May 13, 1968, Ser. No. 728,817. Divided and this application Nov. 30, 1970, Ser. No. 93,895**

**Int. Cl. A61k** *7/16*

**U.S. Cl. 424—54** **2 Claims**

The present invention is an oral deodorant comprising ferrous gluconate and a water soluble reaction product of copper gluconate and glycine.

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**3,655,869**

**TREATMENT OF DIARRHEA EMPLOYING CERTAIN BASIC POLYELECTROLYTE POLYMERS**

**Ferdinand D. Wharton, St. Louis, John H. Johnson, Kirkwood, Joseph E. Fields, Ballwin, and Lawrence J. Machlin, Olivette, Mo., assignors to Monsanto Company, St. Louis, Mo.**

**No Drawing. Filed Jan. 2, 1969, Ser. No. 789,080**

**Int. Cl. A61k** *27/00*

**U.S. Cl. 424—78** **6 Claims**

The treatment or prevention of gastro-enteritis diarrheal syndrome (diarrhea) in a living animal body is accomplished by orally administering to said animal body a therapeutically effective amount of a basic polyelectrolyte polymer, which is (A) a polymerized unsaturated carboxylic acid or anhydride and a derivative of a polymerized unsaturated carboxylic acid or anhydride, (B) a derivative of a polymerized unsaturated carboxylic acid or anhydride or (C) a copolymer of (1) an unsaturated monomer having 2 to 18 carbon atoms and (2) a monomer selected from the group consisting of (a) an unsaturated carboxylic acid or anhydride and a derivative of an unsaturated carboxylic acid or anhydride and (b) a derivative of an unsaturated carboxylic acid or anhydride, as exemplified by N,N-dimethylaminopropylimide of ethylene/maleic anhydride copolymer. The basic polymer is polycationic or polyampholytic in nature. Typical dosage is 0.05 to 5.0% of the total diet.

**3,655,870**

**PROCESS FOR THE MANUFACTURE OF A GRANULAR MATERIAL CONTAINING OILY OR LIQUID THERAPEUTICALLY USABLE FURANOSIDES**

**Guenther Mueller, Arlesheim, Switzerland, assignor to Ciba Corporation, Summit, N.J.**

**No Drawing. Original application July 25, 1969, Ser. No. 845,038, now Patent No. 3,594,474, dated July 20, 1971. Divided and this application Sept. 18, 1970, Ser. No. 73,606**

**Claims priority, application Switzerland, Aug. 5, 1968, 11,704/68**

**Int. Cl. A61j** *3/06;* **A61k** *9/00, 27/00*

**U.S. Cl. 424—80** **16 Claims**

The invention provides a process of manufacture of a free-flowing, solid, granular material, wherein an oily or liquid, therapeutically usable furanoside, such as ethyl-3,5,6-tri-O-benzyl-D-glucofuranoside or ethyl-3-O-propyl-5,6-di-O-para-chlorbenzyl - D - glucofuranoside, is mixed with a film-forming agent and a lower alkanol, the mixture is worked up with magnesium trisilicate to form a plastic mass and the latter granulated while drying it.

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**3,655,871**

**INACTIVATION OF INFLUENZA VIRUSES WITH LOWER ALKYL ESTERS OF ACETIC ACID**

**Georges Werner, Sceaux, France, assignor to Rhone-Poulenc S.A., Paris, France**

**No Drawing. Filed Nov. 20, 1967, Ser. No. 684,540**

**Claims priority, application France, Nov. 21, 1966, 84,337**

**Int. Cl. A61r** *27/00*

**U.S. Cl. 424—89** **5 Claims**

Vaccines are prepared from monovalent or polyvalent inactivated viral suspensions of human, equine, porcine, or fowl influenza viruses, said suspensions being prepared by cultivating in the allantoic cavity of the embryonated chicken egg a said virus, separating the allantoic liquid containing the virus, purifying the viral suspension so obtained by centrifugation, and treating a purified suspension of the virus with diethyl ether or ethyl acetate to inactivate the virus, using conditions which maintain the neuraminidase activity of the virus.

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**3,655,872**

**HIGHLY ATTENUATED RUBELLA VIRUS VACCINE AND PRODUCTION THEREOF**

**Reisaku Kono, Tokyo, Shigeo Yamamoto, Yamaguchi, and Hideaki Yaoi, Nara, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan**

**No Drawing. Filed Apr. 1, 1969, Ser. No. 812,385**

**Int. Cl. C12k** *5/00*

**U.S. Cl. 424—89** **2 Claims**

A novel, highly attenuated live rubella vaccine is prepared by subjecting a specific rubella virus strain to at least 10 passages of cultivation in tissue containing living cells of a warm blooded animal at 28° C. to 36° C. until the desired degree of attenuation is attained.

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**3,655,873**

**METHOD AND PREPARATION FOR TREATMENT OF CARCINOMA**

**Francis M. Duffy, 211 W. Maple, Enid, Okla. 73701**

**No Drawing. Filed July 24, 1970, Ser. No. 58,204**

**Int. Cl. C12k** *7/00*

**U.S. Cl. 424—93** **7 Claims**

A bacteria lysing solution is presented prepared by incubating blood cultures of *Staphylococcus albus* cultured from carcinoma tissue in a multiple electrolyte including 10 percent invert sugar, and insulin at between 98°–100° F. for approximately eight weeks. The solution is useful in treating metastatic carcinoma. Patients suffering with

carcinoma are injected intramuscularly with about 2 cc. of the solution per injection. Treatment is repeated daily for four or five days, and then every two to three days for from one to three months. Observed results with patients suffering from less advanced to metastatic carcinoma include tumor regression, and elimination of pain associated with the disease. Results with patients suffering from advanced terminal conditions show complete elimination of pain. In some instances, a complete tumor regression was observed with subsequent return to health.

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**3,655,874**

**PROCESS FOR THE PURIFICATION OF CRUDE GONADOTROPIN PREPARATIONS**

**Hans van Hell, Titus Brandsmasingel 37, Oss, Netherlands**

**No Drawing. Continuation-in-part of application Ser. No. 513,588, Dec. 13, 1965. This application Apr. 28, 1969, Ser. No. 819,971**

**Claims priority, application Netherlands, Jan. 13, 1965, 6500350**

**Int. Cl. A61k** *17/00, 17/06*

**U.S. Cl. 424—99** **4 Claims**

A gonadotropic hormone is purified by preparing a clear aqueous solution of the hormone containing between about 0.33 and about 0.40 mole fraction of a lower aliphatic alcohol, and having a pH between about 6 and 9, and containing between about 0.013 and about 0.016 mole fraction of a salt soluble in the alcohol such as an ammonium or amine salt of a lower aliphatic carboxylic acid, or a salt of a quaternary ammonium base, and then adding either a lower aliphatic carboxylic acid or an inorganic acid until the pH is between 3 and 6, simultaneously raising the alcohol concentration to between about 0.40 and about 0.52 mole fraction to selectively precipitate the gonadotropic hormone.

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**3,655,875**

**CLAM EXTRACT EFFECTIVE AGAINST SARCOMA 180 AND KREBS-2 CARCINOMA IN MICE**

**Arline Catherine Schmeer, % Mercy Hospital, E. 17th and Milwaukee St., Denver, Colo. 80206**

**Continuation-in-part of application Ser. No. 613,755, Feb. 3, 1967, which is a continuation-in-part of application Ser. No. 377,523, June 24, 1964. This application June 11, 1969, Ser. No. 832,155**

**Int. Cl. A61k** *17/00*

**U.S. Cl. 424—106** **2 Claims**

Biologically active extracts for inhibiting the growth of sarcoma 180 and Krebs-2 carcinoma tumors in mice, and the growth of human HeLa cells in vitro, comprising extracts from the bodies or individual organs or tissues of marine invertebrates such as clams of the genus Mercenaria. The process of forming the extracts comprises the steps of macerating the bodies or individual organs or tissues to form a liquid mixture, causing impurities to precipitate from the liquid mixture, removing the precipitate and subjecting the supernatant liquid to dialysis. The extracts may be further purified by molecular sieve techniques and desalting procedures.

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**3,655,876**

**ANTIBIOTIC CP-21,635**

**Frank C. Sciavolino, Niantic, John B. Routien, Lyme, Edward J. Tynan, Gales Ferry, and Walter D. Celmer, New London, Conn., assignors to Pfizer Inc., New York, N.Y.**

**Filed Aug. 7, 1970, Ser. No. 61,920**

**Int. Cl. A61k** *21/00*

**U.S. Cl. 424—117** **3 Claims**

A new crystalline antibiotic, its production by fermentation, methods for its recovery and concentration and its purification are described.

**3,655,877**

**PLURALLIN AND PRODUCTION THEREOF**

**Hamao Umezawa, 23 Kita, 2-chome, Nerima-ku; Kenji Maeda, 258 Gotanda, 1-chome, Shinagawa-ku; Tomio Takeuchi, 273 Imazumicho, Ota-ku; Kazuo Nitta, 24 Irumacho, 1-chome, Chofu-shi; Yoshiro Okami, 18–3 6-chome, Denenchofu, Ohta-ku; and Hiroshi Ogawara, 33–9 Yushima, 2-chome, Bunkyo-ku, all of Tokyo, Japan**

**Filed Jan. 4, 1966, Ser. No. 518,661**

**Int. Cl. A61k** *21/00*

**U.S. Cl. 424—117** **4 Claims**

The antibiotic substance designated plurallin and comprising a glycoprotein and a pluramycin-like prosthetic group, is produced by fermentation of *Streptomyces pluricolorescens* A.T.C.C. 19145 and found to inhibit the growth of *Corynebacterium xerosis*.

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**3,655,878**

**LATERIOMYCINS A AND B AND PRODUCTION THEREOF**

**Eiji Higashide, Takarazuka, Toru Hasegawa, Suita, Motoo Shibata, Toyonaka, and Komei Mizuno, Suita, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan**

**Filed June 28, 1965, Ser. No. 467,505**

**Int. Cl. A61k** *21/00*

**U.S. Cl. 424—121** **5 Claims**

Lateriomycin A and Lateriomycin B, produced by aerobically culturing a Lateriomycin A- and B- producing strain of *Streptomyces griseoruber* Yamaguchi & Saburi in a culture medium at about 25–35° until substantial antimicrobial activity is imparted to the culture and separately recovering the desired products, are useful in vitro as disinfectants, and in the treatment of Staphylococcus infections.

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**3,655,879**

**RUFOMYCIN**

**Koiti Nakazawa, Amagasaki, Motoo Shibata, Toyonaka, Eiji Higashide and Toshihiko Kanzaki, Nishinomiya, Hiroichi Yamamoto, Kobe, Akira Miyake and Jisaburo Ueyanagi, Nishinomiya, and Hidesuke Isasaki, Toyonaka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan**

**Filed Feb. 7, 1961, Ser. No. 87,677**

**Claims priority, application Japan, Feb. 8, 1960, 35/4,033**

**Int. Cl. A61k** *21/00*

**U.S. Cl. 424—122** **8 Claims**

The invention involves the new antibiotics Rufomycin A (average elemental analysis 62.325% carbon, 7.51% hydrogen and 10.985% nitrogen) and Rufomycin B (average elemental analysis 62.283% carbon, 7.827% hydrogen and 11.753% nitrogen) and methods of producing these antibiotics from *Streptomyces atratus* cultures.

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**3,655,880**

**ANTIBIOTIC SL 3238 AND PROCESS FOR THE PRODUCTION OF SAME**

**Pietro Bollinger, Binningen, Eugen Harri, Therwil, and Hans-Peter Sigg, Binningen, Switzerland, assignors to Sandoz Ltd. (also known as Sandoz AG), Basel, Switzerland**

**Filed Feb. 5, 1970, Ser. No. 8,950**

**Claims priority, application Switzerland, Feb. 12, 1969, 2,086/69**

**Int. Cl. A61k** *21/00*

**U.S. Cl. 424—122** **3 Claims**

The invention concerns a novel antibiotic SL 3238, which can be produced from a strain of the fungus species *Penicillium purpurogenum* Stoll, NRRL 3364.

The antibiotic possesses a high fungistatic effect and also exhibits a systemic effect against dermatophytes.

3,655,881
**METHOD OF TREATING BURNED SKIN**
John C. Jackson, Jr., Seelyville, Ind. (% Commercial Solvents Corp., Terre Haute, Ind. 47808)
No Drawing. Continuation-in-part of application Ser. No. 627,295, Mar. 31, 1967. This application Jan. 22, 1970, Ser. No. 5,107
Int. Cl. A61k *15/02, 27/00*
U.S. Cl. 424—144 4 Claims

A method for the treatment of thermal burns of the skin of mammals by the inducement of calciphylaxis.

3,655,882
**STABLE DIETARY SUPPLEMENT FOR NEW BORN PIGS**
Kenneth N. Wright and Samuel H. Shanklin, Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.
No Drawing. Filed Aug. 26, 1968, Ser. No. 755,450
Int. Cl. A61k *27/00, 15/00, 21/00*
U.S. Cl. 424—147 5 Claims

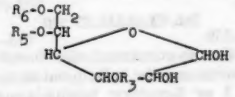
A stable, substantially anhydrous, water-dispersible dietary supplement for supplying supplemental iron antibiotics and vitamins to newborn pigs which comprises a substantially anhydrous, premixed formula including an iron salt such as ferric ammonium citrate, an antibiotic such as neomycin sulfate, a vitamin mineral supplement, and a substantially anhydrous dextrose sweetener. The complete premixed formula is a substantially water-free mixture having an excellent shelf life, but which is readily dispersed in the newborn pig's drinking water for voluntary consumption in amounts sufficient to treat iron deficiency anemia, supplement vitamin requirements and to minimize scours.

3,655,883
**WATER SOLUBLE MAGNESIUM-ALUMINUM ANTACID COMPOSITION**
Alphonse Peter Granatek and Edmund Stanley Granatek, Baldwinsville, and Peter Angelo Ratto, Syracuse, N.Y., assignors to Bristol-Myers Company, New York, N.Y.
No Drawing. Filed May 6, 1968, Ser. No. 727,081
Int. Cl. A61k *27/00*
U.S. Cl. 424—157 7 Claims

Nontoxic aqueous antacid solutions can be prepared by mixing in water a nontoxic magnesium salt, a nontoxic aluminum salt, gluconic acid and sodium or potassium lactate in proportions of about two gram-atoms of aluminum, about two moles of gluconic acid and about two-tenths of a mole of sodium or potassium lactate for each gram-atom of magnesium. A most preferred antacid composition is prepared by mixing the ingredients together in water in a molar ratio of 1.6 moles of gluconic acid per liter, 1.6 moles of aluminum hydroxide per liter, 0.8 mole of magnesium hydroxide per liter and 0.18 mole of sodium lactate per liter.

3,655,884
**ANTIINFLAMATORY GLUCOSE DERIVATIVES**
Alberto Rossi, Oberwil, Basel-Land, and Armin Walter, Riehen, Switzerland, Werner Kessler, Loerrach, Baden, Germany, and Beat Iselin, Riehen, Switzerland, assignors to Ciba Corporation, Summit, N.J.
No Drawing. Filed Sept. 4, 1968, Ser. No. 757,459
Claims priority, application Switzerland, Sept. 11, 1967, 12,702/67; Sept. 25, 1967, 13,374/67; Sept. 26, 1967, 13,419/67; Nov. 28, 1967, 16,760/67; Apr. 25, 1968, 6,161/68
Int. Cl. A61k *27/00*
U.S. Cl. 424—180 5 Claims

Glucofuranose compounds of the formula

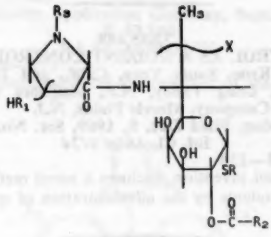



(I)

in which one of $R_3'$, $R_6'$ represents hydrogen, are, in the stituted hydrocarbon residue, with the proviso that $R_3$, $R_5$ and $R_6$ have together at least 4 carbon atoms, as well as acyl derivatives thereof, and salts of compounds having salt-forming groups, said compounds being in pure form, have anti-inflammatory properties. They, as well as those, in which one of $R_3$, $R_6'$ represents hydrogen, are, in the form of pharmaceutical preparations, useful as antiinflammatory agents.

3,655,885
**ANTIBACTERIAL COMPOSITIONS AND METHODS OF TREATING BACTERIAL INFECTIONS**
Walter Morozowich and Anthony A. Sinkula, Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.
No Drawing. Continuation of application Ser. No. 751,067, Aug. 8, 1968, which is a division of application Ser. No. 637,358, May 10, 1967. This application June 10, 1970, Ser. No. 48,827
Int. Cl. A61k *21/00*
U.S. Cl. 424—181 5 Claims

Antibacterial compounds of the formula:




and the salts thereof, and the 3,4-O-arylidene derivatives.

3,655,886
**PHARMACOLOGICALLY EFFECTIVE SUBSTANCE AND PROCESS FOR PREPARING IT**
Alfred Groebel, Bad Soden, Taunus, and Ernst Lindner, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany
Continuation-in-part of abandoned application Ser. No. 731,425, May 23, 1968. This application Aug. 11, 1970, Ser. No. 63,014
Claims priority, application Germany, June 3, 1967, F 52,592
Int. Cl. A61k *27/14*
U.S. Cl. 424—195 5 Claims

A pharmacologically active substance isolated from the bark of *Ravensara aromatica* by extraction of the bark with a lower alcohol, evaporation of the extract to give a solid residue, and chromatography of the residue.

3,655,887
**COMPOSITIONS FOR TREATMENT OF TOXOPLASMOSIS AND COCCIDIOSIS**
Yasuto Takamatsu, Toshio Ishii, Toshio Hayami, and Yoshiharu Tsubota, Tokyo, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan
No Drawing. Filed May 5, 1969, Ser. No. 821,989
Claims priority, application Japan, May 6, 1969, 44/30,170
Int. Cl. A61k *27/00*
U.S. Cl. 424—229 16 Claims

The present invention relates to a method for the prevention or treatment of protozoal infections such as coc-

cidiosis or toxoplasmosis by the use of 3-sulfanilamido-isoxazole and pharmaceutically acceptable salts thereof, preferably in a novel combination with certain anti-coccidial pyrimidine derivative salts.

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**3,655,888**
**ANTICOCCIDIAL COMPOSITIONS**

**Edward C. McManus, Plainfield, and Edward F. Rogers, Middletown, N.J., assignors to Merck & Co., Inc., Rahway, N.J.**

**No Drawing. Continuation-in-part of application Ser. No. 775,506, Nov. 13, 1968. This application Oct. 13, 1969, Ser. No. 866,043**

**Int. Cl. A61k** *27/00*

**U.S. Cl. 424—229** **11 Claims**

Novel anticoccidial compositions contain as an active ingredient 2-loweralkylaminoethanols where the alkyl group has at least two carbon atoms, alone or in combination with certain sulfa drugs, or sulfa drugs and 2,4-diamino-5-aryl-6-alkylpyrimidines. Of particular interest is 2-t-butylaminoethanol alone, quinoxaline or 3-allyloxy-4 - sulfanilamido - 1,2,5 - thiadiazole and 2,4 - diamino-5-(p-chlorophenyl)-6-ethylpyramidine.

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**3,655,889**
**QUINESTROL AS A RODENT CONTROL AGENT**

**Robert L. Kroc, Santa Ynez, Calif., and Terrence W. Mischler, Long Valley, N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.**

**No Drawing. Filed Dec. 9, 1969, Ser. No. 883,633**

**Int. Cl. A01n** *9/24*

**U.S. Cl. 424—238** **1 Claim**

The present invention discloses a novel method for the control of rodents by the administration of quinestrol.

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**3,655,890**
**COMPOSITIONS CONTAINING 3,6-DISUBSTITUTED SYMMETRICAL TETRAZINES, SALTS THEREOF AND METHOD OF USE THEREOF**

**Gordon Arthur Kemp, Princeton, Howard John Bachmann, Spring Lake, Gerald Berkelhammer, Princeton, and Goro Asato, Titusville, N.J., assignors to American Cyanamid Company, Stamford, Conn.**

**No Drawing. Continuation-in-part of application Ser. No. 684,619, Nov. 21, 1967. This application Aug. 17, 1970, Ser. No. 64,597**

**Int. Cl. A61k** *27/00*

**U.S. Cl. 424—244** **10 Claims**

This invention relates to compounds, compositions and a method for controlling the growth of pathogenic microorganisms in warm-blooded animals by administering to said hosts an effective amount of a substituted symmetrical tetrazine compound.

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**3,655,891**
**2-BENZYL-as-TRIAZINE-3,5(2H,4H) DIONES FOR THE CONTROL OF COCCIDIOSIS**

**Harold L. Howes, Jr., East Lyme, and Richard C. Koch, Niantic, Conn., assignors to Pfizer Inc., New York, N.Y.**

**No Drawing. Original application Oct. 16, 1968, Ser. No. 768,192, now Patent No. 3,560,496, dated Feb. 2, 1971. Divided and this application Sept. 18, 1970, Ser. No. 73,662**

**Int. Cl. A61k** *27/00*

**U.S. Cl. 424—249** **11 Claims**

2-benzyl-as-triazine-3,5-(2H,4H) diones and novel 2-substituted - benzyl - as-triazine-3,5(2H,4H) diones and their use as agents for the control of coccidiosis are described.

**3,655,892**
**PHARMACEUTICAL PREPARATIONS AND METHODS OF USING SAME**

**Charles D. Bossinger, Olympia Fields, and Takashi Enkoji, Part Forest, Ill., assignors to Armour Pharmaceutical Company, Chicago, Ill.**

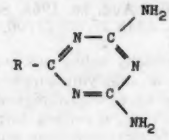
**No Drawing. Filed Nov. 3, 1969, Ser. No. 873,652**
**The portion of the term of the patent subsequent to Dec. 21, 1988, has been disclaimed**

**Int. Cl. A61k** *27/00*

**U.S. Cl. 424—249** **18 Claims**

Preparations containing 2,4-diamino-6-substituted-s-triazines and methods of using same whereby a host, including man, to whom such preparations are administered, is provided with anti-inflammatory relief while avoiding the unwanted side effects of steroid therapy.

The triazine compounds of this invention have the structure



wherein R is selected from the group consisting of primary alkyl, secondary alkyl, tertiary alkyl, said alkyls having from one to 15 carbon atoms, and $R'(CH)_n$ wherein R' is selected from the group consisting of phenyl, diphenyl, chlorophenyl or methoxyphenyl, and "*n*" is a cardinal number having a value of from 1 to 4.

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**3,655,893**
**CHLORONITROPHENYL ETHERS AS NEMATOCIDES**

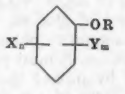
**Delta W. Gier, Laurinburg, N.C., and Daniel M. Wasleski, Kansas City, Mo., assignors to Chemagro Corporation, New York, N.Y.**

**No Drawing. Filed Oct. 16, 1967, Ser. No. 675,331**

**Int. Cl. A01n** *9/00*

**U.S. Cl. 424—250** **2 Claims**

Compounds of the formula



where R is alkyl, cycloalkyl, dihalo triazinyl, quinoxalinyl, alkyl quinoxalinyl, acetonyl, arylketoalkyl, epoxyalkyl, aminoarylketoalkyl, haloarylketoalkyl, X is halogen, Y is nitro, *n* is an integer of 1 to 3 and *m* is an integer of 1 to 2 have been found useful as nematocides, herbicides, fungicides and desiccants.

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**3,655,894**
**COMPOSITIONS FOR INHIBITING GASTRIC ACID SECRETION**

**William A. Bolhofer, Frederick, and John J. Baldwin, Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.**

**No Drawing. Original application Dec. 28, 1966, Ser. No. 605,206, now Patent No. 3,510,487, dated May 5, 1970. Divided and this application Aug. 28, 1969, Ser. No. 853,946**

**Int. Cl. A61k** *27/00*

**U.S. Cl. 424—250** **5 Claims**

This application is concerned with novel 2,3-dichloroquinoxalines which may be substituted in the 5, 6, and 7-positions, the 5 or 6-position having a substituted car-

bamoyl group and the 7-position having as substituents hydrogen, halo, loweralkyl, or loweralkoxy. These novel quinoxalines, useful as gastric acid inhibitors, may be prepared by intimately contacting 5(6)-chlorocarbonyl-2,3-dichloroquinoxaline or the appropriately 7-substituted-6-chlorocarbonyl-2,3-dichloroquinoxaline with an amine having at least one replaceable hydrogen atom.

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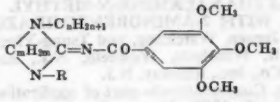
**3,655,895**

## METHODS OF TREATMENT USING 2-ACYLIMINO-1,3-DIAZACYCLOALKANES

**Robert Armistead Lucas, Mendham, and Herbert Morton Blatter, Summit, N.J., assignors to Ciba Corporation, Summit, N.J.**

**No Drawing. Filed July 7, 1969, Ser. No. 839,704**
**Int. Cl. A61k 27/00**
**U.S. Cl. 424—251** **2 Claims**

1-alkyl-2-(3,4,5-trimethoxybenzoylimino)-1,3-diazacycloalkanes, e.g. those of the formula



R=H, alkyl or 3,4,5-trimethoxybenzoyl
$m$=2 or 3,
$n$=1–4

and salts thereof exhibit sedative effects.

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**3,655,896**

## PHARMACEUTICAL COMPOSITIONS CONTAINING A SYMPATHOMIMETIC AMINE AND A TRIAZOLO-PYRIMIDINE DERIVATIVE AND METHODS OF PREVENTING BRONCHOSPASMS

**George Edward Davies, Michael Dukes, and Thomas Paterson Johnston, Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England**

**No Drawing. Filed Aug. 22, 1969, Ser. No. 852,506**
**Claims priority, application Great Britain, Feb. 28, 1969, 10,901/69**
**Int. Cl. A61k 27/00**
**U.S. Cl. 424—251** **7 Claims**

A method of preventing bronchospasm by administering in conjunction a sympathomimetic amine and a 2-amino (or substituted amino)-4-alkyl-5-oxo-6-alkyl-4,5-dihydro-s-triazolo[1,5-a]pyrimidine derivative, and also pharmaceutical compositions containing the above two components. The triazolo-pyrimidine derivatives were not previously known to possess bronchospasm inhibiting properties, and in addition the combined effect of both components is much greater than the sum of the individual effects.

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**3,655,897**

## ANTI-INFLAMMATORY AGENTS

**Bruce E. Witzel, Westfield, N.J., assignor to Merck & Co., Inc., Rahway, N.J.**

**No Drawing. Continuation-in-part of application Ser. No. 879,925, Nov. 25, 1969. This application Jan. 25, 1971, Ser. No. 109,707**
**Int. Cl. A61k 27/00**
**U.S. Cl. 424—263** **30 Claims**

The treatment of inflammation, pain and fever utilizing compositions containing alkyl substituted pyridones, thiopyridones and pyridines.

**3,655,898**

## USE OF PYRIDYLTHIURONIUM SALTS AS FUNGICIDES

**Patrick R. Driscoll, Spotswood, N.J., assignor to Mobil Oil Corporation**

**No Drawing. Filed June 30, 1969, Ser. No. 837,948**
**Int. Cl. A01n 9/00**
**U.S. Cl. 424—263** **6 Claims**

Certain pyridylthiuronium halide salts substituted in the 2- or 4-position with the thiuronium halide substituent form a new class of fungicides. They are highly effective as spore fungicides against *Monilinia fructicola* and *Stemphylium sarcinaeforme*. They also are highly effective as soil fungicides against *Fusarium oxysporium, Pythium debaryanum, Rhizoctonia solani,* and *Sclerotium rolfsii.*

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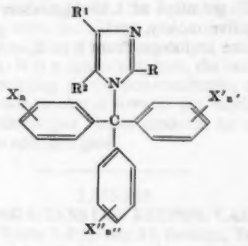
**3,655,899**

## N-TRITYL-IMIDAZOLES FOR TREATING FUNGAL INFECTIONS

**Karl H. Buchel, Leverkusen, Erik Regel, Wuppertal-Cronenberg, and Manfred Plempel, Wuppertal-Elberfeld, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany**

**No Drawing. Original application Sept. 9, 1968, Ser. No. 758,594. Divided and this application May 11, 1970, Ser. No. 36,425**
**Claims priority, application Germany, Sept. 15, 1967, F 53,504**
**Int. Cl. A61k 27/00**
**U.S. Cl. 424—273** **4 Claims**

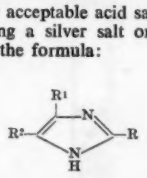
N-trityl-imidazoles and salts thereof of the formula:



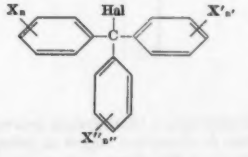
wherein

R, $R^1$ and $R^2$ are hydrogen, lower alkyl or phenyl, or $R^1$ and $R^2$ together form an anellated benzene ring,
X, X′ and X″ are alkyl of 1 to 12 carbon atoms or an electro-negative moiety, and
$n$, $n'$ and $n''$ are an integer from 0 to 2,

or pharmaceutically acceptable acid salts thereof may be produced by reacting a silver salt or alkali metal salt of an imidazole of the formula:



with a trityl halide of the formula:



wherein the substituents are as above defined and Hal is halogen. These compounds are useful as antimycotics.

## 3,655,900
## N-TRITYL-IMIDAZOLES FOR TREATING FUNGAL INFECTIONS

**Karl H. Buchel, Leverkusen, Erik Regel, Wuppertal-Cronenberg, and Manfred Plempel, Wuppertal-Elberfeld, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany**

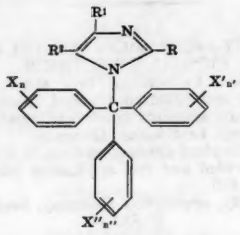
**No Drawing. Original application Sept. 9, 1968, Ser. No. 758,594. Divided and this application May 11, 1970, Ser. No. 36,426**

**Claims priority, application Germany, Sept. 15, 1967, F 53,504**

**Int. Cl. A61k 27/00**

**U.S. Cl. 424—273** **14 Claims**

N-trityl-imidazoles and salts thereof of the formula:



wherein

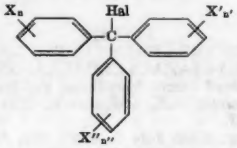
R, $R^1$ and $R^2$ are hydrogen, lower alkyl or phenyl, or $R^1$ and $R^2$ together form an anellated benzene ring,

X, X′ and X″ are alkyl of 1 to 12 carbon atoms or an electro-negative moiety, and

*n*, *n*′ and *n*″ are an integer from 0 to 2,

or pharmaceutically acceptable acid salts thereof may be produced by reacting a silver salt or alkali metal salt of an imidazole of the formula:

with a trityl halide of the formula:



wherein the substituents are as above defined and Hal is halogen. These compounds are useful as antimycotics.

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## 3,655,901
## METHOD OF INHIBITING THE FORMATION OF PHENYLETHANALAMINE-N-METHYL TRANSFERASE WITH 2-AMINOBENZIMIDAZOLES

**Norman P. Jensen, Watchung, and Tsung-Ying Shen and Thomas B. Windholz, Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.**

**No Drawing. Continuation-in-part of application Ser. No. 8,002, Feb. 2, 1970. This application July 30, 1970, Ser. No. 59,697**

**Int. Cl. A61k 27/00**

**U.S. Cl. 424—273** **1 Claim**

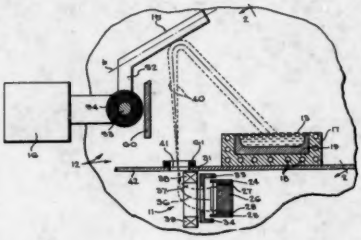
New 2-aminobenzimidazoles useful in the inhibition of phenylethanolamine-N-methyl transferase.

# ELECTRICAL

## 3,655,902
## HEATING SYSTEM FOR ELECTRON BEAM FURNACE

Alexander H. Firestone, El Sobrante; Robert W. Fisk, Sunnyvale, and Kurt D. Kennedy, Berkeley, all of Calif., assignors to Air Reduction Company, Incorporated, New York, N.Y.

Filed Oct. 19, 1970, Ser. No. 81,720
Int. Cl. H05b 7/00
U.S. Cl. 13—31 9 Claims

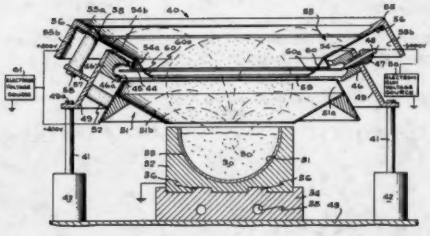


An electron beam furnace heating system is described wherein an electron beam produced by an electron gun is directed to a target by a transverse magnetic field in the path of the beam. The field is established by a pair of bar-shaped pole pieces having their longitudinal axes in a common plane and the field of sufficient strength that the beam is deflected to emerge from the same side of the magnetic field as the side from which it enters.

## 3,655,903
## ANNULAR ELECTRON GUN

Leonard F. Roman, 11018 Moorpark, North Hollywood, Calif., and George H. Elliott, 16501 Knollwood Drive, Granada Hills, Calif.

Filed Apr. 1, 1969, Ser. No. 812,263
Int. Cl. H05b 7/00
U.S. Cl. 13—31 10 Claims

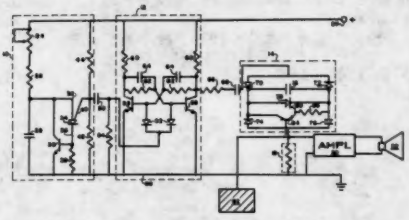


An annular electron gun adapted to produce a conical electron beam capable of vaporizing a source material situated at the apex of the beam. The gun comprises an annular filament, a truncated conical electrode disposed coaxially just below the beam, and an annular wire ring electrode suspended just above the beam in coaxial spaced relation with the conical electrode. The filament is maintained at a high negative potential, the electrodes at the same positive potential. Vaporized atoms of source material are ionized by the annular electrodes, and accumulate into an ion cloud within the cone of, but separated from, the electron beam.

## 3,655,904
## ELECTRIC VARIABLE TONE PERCUSSION INSTRUMENT

Herbert Cohen, 180 West End Avenue, New York, N.Y.

Filed Dec. 14, 1970, Ser. No. 97,493
Int. Cl. G10h 1/00
U.S. Cl. 84—1.01 11 Claims

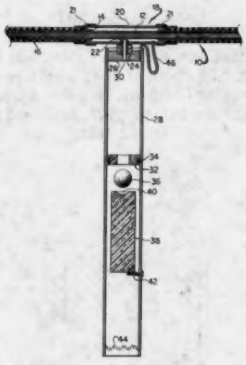


An electric variable tone percussion instrument comprises a source of periodic signals, storage means coupled to the source of periodic signals, output means coupled to the storage means and switching means coupled to the storage means, the switching means normally being in a non-conducting state, the storage means being charged to a maximum storage voltage and the output means producing an minimum output voltage while the switching means is in the non-conducting state, the storage means discharging and the output means producing a maximum output voltage when the switching means is in a conducting state, the switching means immediately returning to the non-conducting state causing the storage means to charge towards the maximum storage voltage while the output means produces an exponentially decaying output voltage signal.

## 3,655,905
## METHOD AND MEANS FOR KEEPING CABLES DRY

Jimmy C. Ray, Route 2, P.O. Box 33, Denison, Tex.

Filed Jan. 4, 1971, Ser. No. 103,443
Int. Cl. H02g 9/00, 15/00
U.S. Cl. 174—11 R 13 Claims



The sheath around underground communication cables is opened at low points at frequent intervals. A sleeve is placed around the opening in the sheath and a tap in the sleeve drains fluid to a metalic cylinder. The cylinder contains a

float valve so that water can drain from the cable into the cylinder and the cylinder is open at the bottom so the water may drain into the soil. The float valve prevents ground water from flowing into the cable. The cylinder may be electrically bonded to the sheath in which instance it acts as an anode for electrolytic corrosion protection.

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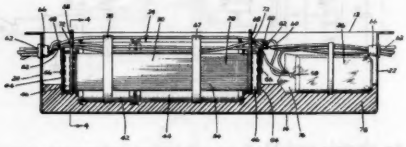
**3,655,906**

## LAMP BALLAST AND METHOD OF PRODUCING SAME

**Robert E. Robb, Danville, Ill., assignor to General Electric Company**

**Filed Oct. 19, 1970, Ser. No. 81,759**
**Int. Cl. H05k 5/06**
**U.S. Cl. 174—52 PE** **4 Claims**



A lamp ballast wherein a magnetic core and coil assembly is encased within a housing and is spaced from the housing with a suitable filler material filling the space between the magnetic core and coil assembly and the housing. The magnetic core and coil assembly is suspended within the housing having an open top, being spaced from the sides and bottom thereof by suspension means. The housing or casing is then partially filled with the suitable filler material in liquid form, to a level wherein at least a portion of the magnetic core and coil assembly is immersed in the filler material. After the filler material has hardened to an extent that it will support the core and coil assembly, portions of the suspension means are removed such that when the housing is completely filled with the filler material the core and coil assembly will be completely surrounded by the filler material and the suspension means will not extend from the core and coil assembly to the casing. Thus, the suspension means does not provide a surface joining the casing and the core and coil assembly along which moisture entering the casing may reach the core and coil assembly.

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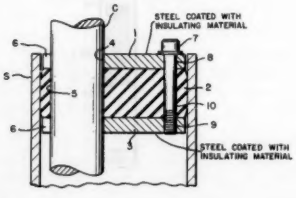
**3,655,907**

## CONDUIT CABLE SEAL

**Robert A. Philibert, Rockville Centre, and Frank L. Browne, Wantagh, L. I., both of N.Y., assignors to O.Z. Electrical Manufacturing Company, Inc., New York, N.Y.**

**Filed Oct. 16, 1970, Ser. No. 81,230**
**Int. Cl. H02g 15/04**
**U.S. Cl. 174—77 R** **3 Claims**




There has been provided a conduit cable seal comprising a clamping means having at least two relatively thin, spaced steel plates having axial holes therethrough for passing a cable and a radial slot extending from an outer end of each of the cable holes to the outer edge of the plates. A fastening means draws one plate close to the other and a resilient sealing member disposed between the plates seals the conduit beyond the cable seal when the fasteners urge the plates toward each other.

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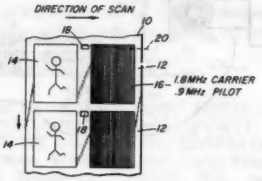
**3,655,908**

## APPARATUS FOR REPRODUCING COLOR PICTURE INFORMATION

**Abraham A. Goldberg, Stamford, and Renville H. McMann, Jr., New Canaan, both of Conn., assignors to Columbia Broadcasting System, Inc.**

**Filed June 19, 1970, Ser. No. 47,740**
**Int. Cl. H04n 9/12**
**U.S. Cl. 178—5.4 CD** **8 Claims**




Apparatus for reproducing color picture information that has been recorded on a record medium in a succession of information-bearing areas including areas carrying luminance picture information and different areas carrying color picture information in the form of superimposed records of two color difference signals, suppressed carrier modulated in quadrature phase to each other and a pilot carrier signal at a different frequency. The system comprises means including a flying spot scanner for scanning the record medium without line tracking and a pair of photomultipliers for respectively detecting the luminance and color picture information. The color information signal, containing the color difference signals and the pilot signal are separated into its individual components, and the color signals are directly translated to NTSC frequency, or other frequency standard, by frequency conversion for combination with the luminance picture information signal for presentation on a television receiver.

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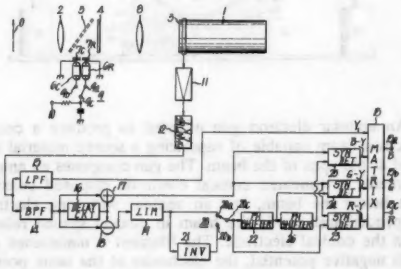
**3,655,909**

## COLOR TELEVISION CAMERA

**Yasuharu Kubota, Kanagawa-ken, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Filed Oct. 20, 1970, Ser. No. 82,460**
**Claims priority, application Japan, Oct. 21, 1969, 44/84102**
**Int. Cl. H04n 9/06**
**U.S. Cl. 178—5.4 ST** **6 Claims**




A color television camera includes an image pickup tube having a scanning surface to convert an image of an object projected thereon through a color filter into a signal and two

light sources projecting a red light and a cyan light alternatively on the scanning surface through the color filter to provide an index signal of alternately changing phase in the composite signal constituting the output of the tube.

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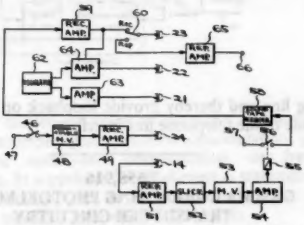
**3,655,910**
**A MAGNETIC RECORDING, REPRODUCING, AND EDITING APPARATUS**

**Yoshiyo Wada, and Katsuya Yasutake, both of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan**

**Filed Aug. 12, 1969, Ser. No. 849,318**
**Claims priority, application Japan, Aug. 13, 1968, 43/57115**
**Int. Cl. G11b** *27/02;* **H04n** *5/78*
**U.S. Cl. 178—6.6 A** **4 Claims**




A magnetic recording and reproducing apparatus in which a cue signal or other detection pulse signal is recorded on a magnetic tape. The cue signal marks a timing point for editing signals recorded on the magnetic tape, while the movement of the magnetic tape is temporarily stopped. A recorded detection pulse signal is reproduced at a relative speed, with respect to the tape speed, in editing the signals while the magnetic tape is moving. Thus, the editing point can be detected positively and easily.

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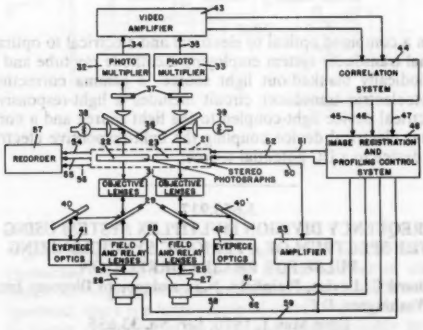
**3,655,911**
**AUTOMATIC STEREOPLOTTING SYSTEM**

**Howard Ronald Johnston, Lexington, Mass., assignor to Itek Corporation, Lexington, Mass.**

**Filed Dec. 22, 1969, Ser. No. 887,157**
**Int. Cl. H04n** *7/02*
**U.S. Cl. 178—6.8** **21 Claims**




Disclosed in an automatic stereoplotting system utilizing a registration error signal responsive servomechanism to correct parallax and indicate elevation of actual terrain imaged at certain points in a pair of stereo photographs. The inherent steady state following error of the servomechanism is compensated to provide an elevation indicating output that corresponds in time with output signals identifying the relative positions of the image points being considered.

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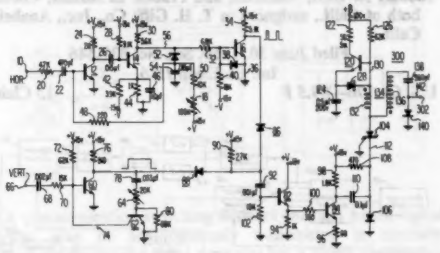
**3,655,912**
**CORONA GENERATING CIRCUITS FOR ELECTROPHOTOGRAPHIC PRINTERS COOPERATIVELY OPERATING WITH TELEVISION RECEIVERS**

**Ross William Bruce, Jr., Willingboro, N.J., assignor to RCA Corporation**

**Filed Sept. 24, 1970, Ser. No. 75,011**
**Int. Cl. G03g** *5/02, 13/04;* **H04n** *1/30*
**U.S. Cl. 178—6.6 A** **7 Claims**



Corona generating pulses applied to an electrophotographic charging structure are generated in substantial time synchronism with a horizontal flyback pulse available in the television receiver and from which they are derived. The repetition rate and number of corona pulses which are applied can be selectively controlled to provide an optimum visible image on the electrophotographic recording medium. Such image is characterized by the relative absence of toner particles in the reproduced background.

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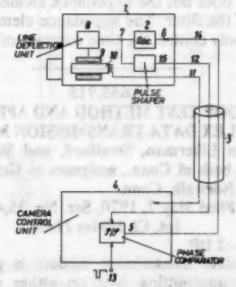
**3,655,913**
**ARRANGEMENT FOR SYNCHRONIZING TELEVISION CAMERAS**

**Hans-Dieter Schneider, Gross-Gerau, Germany, assignor to Fernseh GmbH, Darmstadt, Germany**

**Filed Apr. 21, 1970, Ser. No. 30,428**
**Claims priority, application Germany, Apr. 25, 1969, P 19 21 104.2**
**Int. Cl. H04n** *5/04*
**U.S. Cl. 178—69.5 DC** **6 Claims**




A circuit used to synchronize a television camera interconnected to a camera control unit through a cable having a plu-

rality of conductive leads. An oscillator within the camera generates a rectangular-shaped pulse signal at line frequency, and applies this signal to a phase comparator in the control unit. The signal is transmitted from the oscillator through the cable. The phase comparator compares the rectangular-shaped pulse signal with a reference signal, and provides a control voltage which, in turn, is applied to the oscillator through a conductor within the cable. The signal derived from the oscillator may be in the form of closely spaced pulses of opposite polarity and short direction. The signal can also be in the form of a pair of pulse trains of opposite polarity and transmitted through the cable by a twisted pair of conductors.

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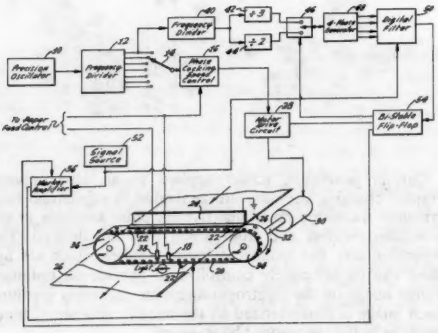
## 3,655,914
## FACSIMILE SYSTEM

**Thomas H. Gifft, Anaheim, and Francis E. Adams, Corona, both of Calif., assignors to T. H. Gifft Co., Inc., Anaheim, Calif.**

**Filed June 30, 1969, Ser. No. 837,546**
**Int. Cl. H04n 1/36**
**U.S. Cl. 178—69.5 F** **13 Claims**



The present invention is directed to a facsimile system incorporating a digital filter, which digital filter is used to detect the presence of a start signal and a stop signal in an input signal, which start and stop signals control the starting and stopping of the facsimile system. The digital filter used in the facsimile system of the present invention includes an electronic switch which is switched under the control of a reference signal. An input signal is also applied to the digital filter and the digital filter provides for an output signal when there is a frequency correlation between the reference signal and the input signal. The digital filter provides a very sharp response and does not use impedance elements to determine the tuning of the filter. The impedance elements used in the digital filter only control the time constant of the filter.

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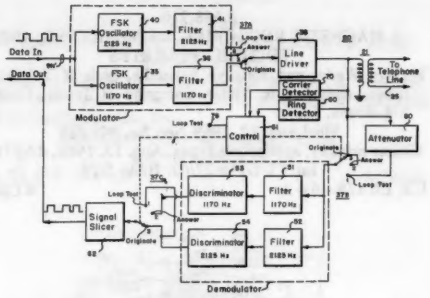
## 3,655,915
## CLOSED LOOP TEST METHOD AND APPARATUS FOR DUPLEX DATA TRANSMISSION MODEM

**Richard Allen Liberman, Stratford, and Steven Jay Davis, Ridgefield, both of Conn., assignors to General Datacomm Industries, Norwalk, Conn.**

**Filed May 7, 1970, Ser. No. 35,454**
**Int. Cl. H04m 11/06**
**U.S. Cl. 179—2 DP** **2 Claims**

A duplex data transmission modem is provided having facilities for transmitting data on either a call originate frequency F1 or a call answer frequency F2 while simultaneously receiving data on a call originate frequency F2 and a call answer frequency F1. Control apparatus is provided in the modem for closed loop testing wherein the modem receiver is forced to receive the normal outgoing data modulated carrier signal and return the data signal back to the incoming line and thereby provide loopback on the analog or tone side of the telephone line interface.



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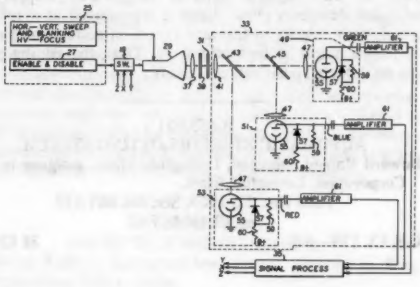
## 3,655,916
## GAMMA CORRECTING PHOTOELECTRIC TRANSDUCER CIRCUITRY

**Robert Charles Wheeler, Elba, N.Y., assignor to Sylvania Electric Products Inc.**

**Filed Jan. 15, 1970, Ser. No. 3,030**
**Int. Cl. H04n 9/53, 9/08, 5/20**
**U.S. Cl. 178—5.4 R** **13 Claims**



In a combined optical to electrical and electrical to optical signal transducer system employing a cathode ray tube and a periodically blanked-out light source, a gamma correcting photoelectric transducer circuit includes a light-responsive electrical device light-coupled to the light source and a non-linear electrical device coupling the light-responsive electrical device to a DC potential source.

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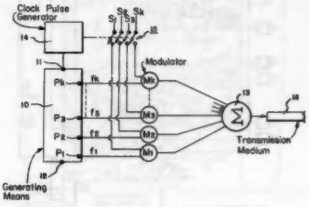
## 3,655,917
## FREQUENCY DIVISION MULTIPLEX SYSTEM USING THE SPECTRUM OF A PERIODIC SYNCHRONIZING PULSE FOR PHASE CORRECTION

**Richard C. Levine, Plainfield, N.J., assignor to Diecomp Inc., Washington, D.C.**

**Filed May 1, 1970, Ser. No. 33,655**
**Int. Cl. H04j 1/20**
**U.S. Cl. 179—15 BS** **16 Claims**

A transmission system for transmitting data at optimum speeds through non-optimum transmission media utilizes a plurality of subcarriers having different frequencies and a special time synchronizing pulse wave having the subcarrier

frequencies as its principal frequency components. In addition to providing time synchronization, the pulse wave provides phase and frequency reference information for correcting the phase and frequency of locally generated reference signals used in the demodulation of the data-carrying signal. This demodulation can be any type of demodulation which is




expeditiously carried out using a local signal of known phase such as, for example, phase-sensitive demodulation, product demodulation, square-law demodulation, or frequency demodulation. In a preferred embodiment, a transmitting apparatus is so arranged that its components subsystems can be conveniently modified to operate as a receiver.

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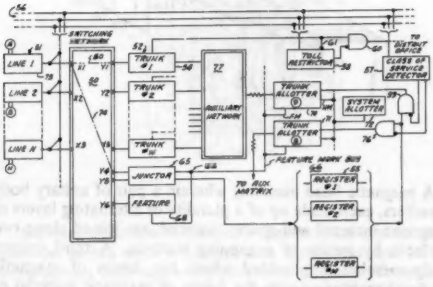
**3,655,918**

## TRUNK ALLOTTER

**Benjamin R. Marbury, Oak Lawn; Alfred M. Hestad, Chicago, and Jose Reines, Glen Ellyn, all of Ill., assignors to International Telephone and Telegraph Corporation**

**Filed Apr. 17, 1970, Ser. No. 29,600**
**Int. Cl. H04q** *3/42*
**U.S. Cl. 179—18 GF** **16 Claims**



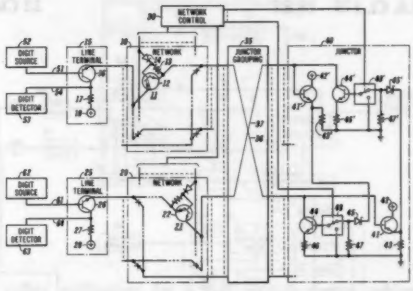

A trunk allotter controls a number of parallel switches connected between the allotter and a number of circuits which are segregated into groups. When a switch is to be operated, there is a large supply of current which is sufficient to insure operation of at least one—and probably several—parallel switches. By its operation, the switch pre-selects an idle circuit. Then, the current is reduced to a level which is sufficient to hold only one of the parallel switches and to turn off the remainder of the switches. After the allotter operates, a counter steps on to enable the allotter to allot one of a second group of equivalent circuits.

**3,655,919**

## BILATERAL ELECTRICAL COMMUNICATION SWITCHING NETWORK

**Rein Raymond Laane, Wheaton, Ill., assignor to Bell Telephone Laboratories Incorporated, Berkeley Heights, N.J.**

**Filed Nov. 16, 1970, Ser. No. 89,598**
**Int. Cl. H04q** *3/50*
**U.S. Cl. 179—18 GF** **18 Claims**




A communication switching network through which digital signals may be simultaneously transmitted in opposite directions during the same time slot on a single conducting path. The impedances at opposite ends of the path are deliberately mismatched with the result that digital information is transmitted from the low impedance to the high impedance end of the network as voltage changes while the same information may be simultaneously transmitted from the high impedance end to the low impedance end of the network as current changes.

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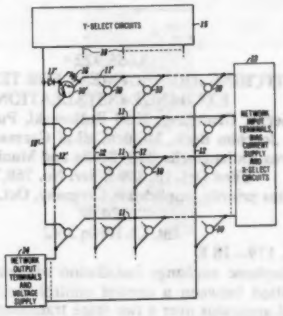
**3,655,920**

## ELECTRICAL COMMUNICATION SWITCHING NETWORK

**Rein Raymond Laane, Wheaton, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.**

**Filed Nov. 16, 1970, Ser. No. 89,599**
**Int. Cl. H04q** *3/50*
**U.S. Cl. 179—18 GF** **17 Claims**


Y-SELECT CIRCUITS
NETWORK INPUT TERMINALS, BIAS CURRENT SUPPLY AND X-SELECT CIRCUITS
NETWORK OUTPUT TERMINALS AND VOLTAGE SUPPLY

A communication switching network having semiconductor crosspoint elements defining unbalanced transmission paths therethrough wherein the effects of loss variations and crosstalk are substantially reduced by deliberately mismatching the impedances at opposite ends of each crosspoint path as seen from the crosspoint so that signal transmis-

sion through the crosspoint involves relatively large current variations with only very small voltage variations.

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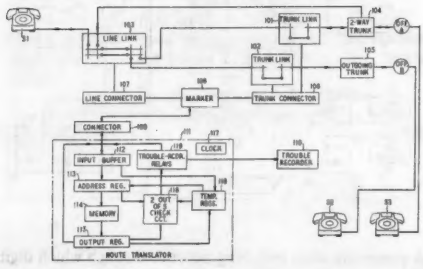
**3,655,921**
**ELECTRONIC ROUTE TRANSLATOR**
**Richard Cobbold Busick, and Eugene Daniel Masucci, both of Columbus, Ohio, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.**
**Filed Mar. 30, 1970, Ser. No. 23,942**
**Int. Cl. H04q *3/47***
**U.S. Cl. 179—18 ET** **22 Claims**




An electronic route translation system arranged to translate a first combination of 3, 4, or 6 numerical digits to a second predetermined combination of 3 numerical digits. The translator selectively reads segments of word information directly from memory into one output register without using additional adding, subtracting, shifting or masking functions. The read feature permits the same address in memory to be interrogated several times in a single translation with different segments of the same word being used each time. Internal manipulations are accomplished by data substitution in the address field. The input digits are employed without conversion to form the first translation table address and subsequent addresses are formed by a combination of the input digits and control data obtained from interrogation of the memory. A check is applied to each registered digit after every register transfer, thereby providing an extremely well-defined error stop function.

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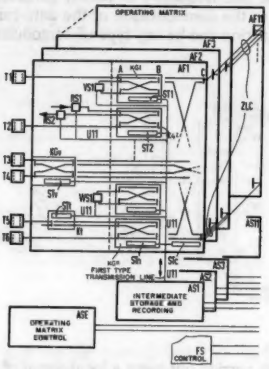
**3,655,922**
**SWITCHING ARRANGEMENT FOR TELEPHONE EXCHANGE-INSTALLATION**
**Peter Gerke, Grafelfing; Karl Rutkowski, Pullach, and Helmuth Joachim Bock, Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany**
**Filed Oct. 18, 1968, Ser. No. 768,751**
**Claims priority, application Germany, Oct. 19, 1967, S 112478**
**Int. Cl. H04q *3/42***
**U.S. Cl. 179—18 E** **8 Claims**

A telephone exchange installation wherein information is transmitted between a central control mechanism and individual apparatus over a two-stage transmission network including buffer storage means interposed between the two stages. Information is transmitted in parallel code between the buffer storage means and the individual apparatus which utilizes relatively inexpensive and relatively slow-working switching elements. Information is transmitted in series code between the buffer storage means and the central control mechanism which utilizes electronic, relatively fast-working switching elements. Optimum utilization of the telephone exchange equipment is thereby achieved by adjusting for the differing speed of operation of the switching elements in the




central control and the individual apparatus and the resulting variance in the speed of information transmission.

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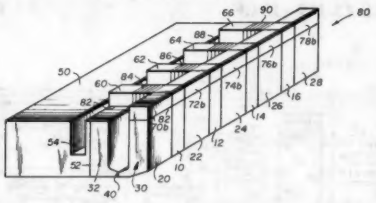
**3,655,923**
**PREFORMED MULTIPLE TRACK MAGNETIC HEAD ASSEMBLY**
**Alphonse Gregory Lang, Jr., West Caldwell, N.J., assignor to Ceramic Magnetics, Inc., Fairfield, N.J.**
**Filed Feb. 2, 1970, Ser. No. 7,698**
**Int. Cl. G11b *5/28***
**U.S. Cl. 179—100.2 C** **2 Claims**




A magnetic head assembly wherein a pair of unitary body members, each made up of a plurality of alternating layers of magnetic material and spacer material, are joined along two surfaces by means of a gapping material. A third unitary body member is provided which has layers of magnetic material registering with the layers of magnetic material of the other body members to provide a plurality of separate paths for magnetic flux.

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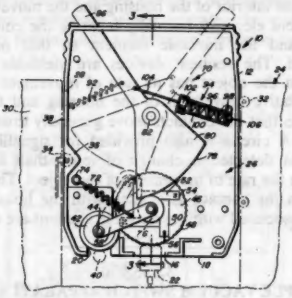
**3,655,924**
**TAPE PICK-UP HEAD DEMAGNETIZER**
**Elek Puskas, Cherry Hill, N.J., assignor to Steve Snyder Enterprises, Inc.**
**Filed Dec. 1, 1970, Ser. No. 94,017**
**Int. Cl. G11b *5/46*; H01f *13/00***
**U.S. Cl. 179—100.2 D** **13 Claims**

The pick-up head of a magnetic tape player is demagnetized by a moving, alternating magnetic field generated within the front end portion of a cartridge-type housing inserted into the player. The drive capstan of the player drives

a carrier on which magnets are mounted to produce said alternating magnetic field. The carrier is reciprocated through



a predetermined stroke relative to the pick-up head by an actuating mechanism.

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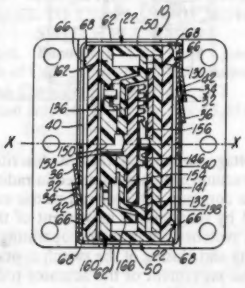
3,655,925

## THUMBWHEEL SWITCH STRUCTURE WITH IMPROVED U-SHAPED FASTENERS FOR MULTIPLE GAUGED SWITCH HOUSING ASSEMBLY

Thomas C. Lincoln, and Andrew Voge, both of Arcadia, Calif., assignors to Becton Dickinson Electronics Company, Pasadena, Calif.

Filed Apr. 13, 1971, Ser. No. 133,602
Int. Cl. H01h 19/58, 9/26
U.S. Cl. 200—11 TW 7 Claims



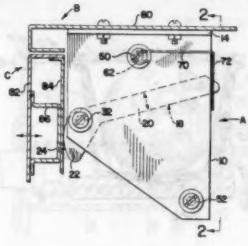
A switch structure or assembly that includes one or more modular switch units is formed with a recess around its top wall, bottom wall, and end plates. Two ridges are formed on each end plate, which ridges extend the full width of the recess but which are narrow compared with the height of the end plates. Two identical U-shaped bands lie within the recessed portion and together embrace the switch structure or assembly. One leg of each band is shorter than the other leg of each band, the longer leg of each band being adapted to extend over both ridges of one end plate and the shorter leg being adapted to extend over only one ridge of the opposite end plate. Tongues are lanced near the ends of the longer legs of each band and slots are lanced near the ends of the shorter legs of each band. The tongue of a first band engages the slot of the second band on one side of the switch structure or assembly while the tongue of the second band engages the slot of the first band on the other side of the switch structure or assembly. The bands are securely hooked together by engagement of their respective tongues and slots and thereby hold the switch structure together.

3,655,926

## SAFETY MECHANISM FOR HIGH VOLTAGE CABINETS

Ronald A. Meermans, Cuyahoga, Ohio, assignor to Park-Ohio Industries, Inc., Cleveland, Ohio

Filed Mar. 29, 1971, Ser. No. 129,046
Int. Cl. H01h 9/20
U.S. Cl. 200—50 A 13 Claims



A safety mechanism for a high voltage source cabinet wherein the mechanism has a first position which renders the high voltage source inoperative when a cabinet access door is open and a second position which renders the high voltage source operative when the access door is closed. The mechanism further includes a third position which permits the high voltage source to be manually placed in an operative condition when the access door is open. The latch includes retaining means which are automatically released when the access door is again closed.

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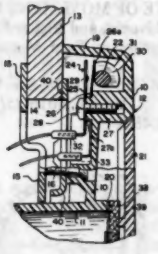
3,655,927

## INLET VALVE AND SWITCH FOR CENTRAL VACUUM CLEANER

Bruce E. Samuelson, St. Paul, and Robert A. Dunst, White Bear Lake, both of Minn., assignors to Whirlpool Corporation

Filed Apr. 15, 1970, Ser. No. 28,649
Int. Cl. H01h 3/16
U.S. Cl. 200—61.6 6 Claims

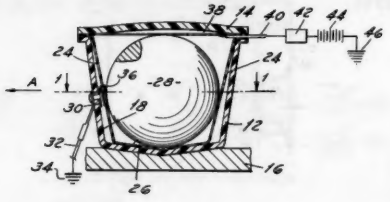


An inlet valve and switch device for a central vacuum cleaner system having a suction tube with an exposed inlet end and a cover plate for the tube inlet end that can be opened to expose the tube for connecting a cleaning device to it in which the opening movement of the cover plate closes the switch that energizes the central vacuum cleaner. The closing of the cover plate against the inlet end of the tube opens the switch to de-energize the central vacuum cleaner.

## 3,655,928
## DEVICE FOR DETECTING AND SIGNALING A CHANGE OF MORE THAN A PRESCRIBED AMOUNT IN THE RATE OF MOVEMENT OF AN OBJECT

Elton D. Engel, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 23, 1970, Ser. No. 83,559
Int. Cl. H01h 35/14
U.S. Cl. 200—61.45 6 Claims

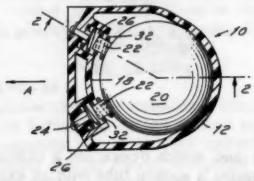



The device detects and signals a change of more than a prescribed amount in the rate of movement of an object. The major elements forming the device include the following. A housing is secured to the object. This housing has a first contact area formed on the surface area in the interior thereof. A sphere is movably contained by a resiliently deformable confinement within the interior of the housing. The confinement is interposed between the sphere and the surface area forming the interior of the housing. The confinement is deformable toward the interior surface when the sphere moves within the confinement in response to a change in the rate of movement of the object. A second contact area is formed on the surface of the confinement in juxtaposition to the first contact area on the interior of the housing. When the sphere deforms the confinement sufficiently, in response to a change in the rate of movement of the object of more than a predetermined amount, the first and the second contact areas are brought together to complete a circuit therethrough. Upon closing of the contacts, appropriate circuits indicate that the change of more than a prescribed amount has taken place in the rate of movement of the object.

## 3,655,929
## DEVICE FOR DETECTING AND SIGNALLING A CHANGE OF MORE THAN A PRESCRIBED AMOUNT IN THE RATE OF MOVEMENT OF AN OBJECT

Elton D. Engel, Livonia, and Richard H. Miller, Wayne, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 23, 1970, Ser. No. 83,550
Int. Cl. H01h 35/14
U.S. Cl. 200—61.45 R 5 Claims

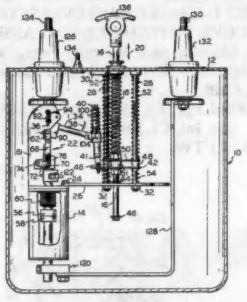



The device detects and signals a change of more than a prescribed amount in the rate of movement of an object. The major elements forming the device include the following. A housing is secured to the object. This housing encloses a movable element. Contacts are, in part, associated with the interior surface of the housing and, in part, associated with the movable element for completing a circuit therethrough when closed. Resilient elements are employed for acting between the interior of the housing and the movable element. The resilient elements normally separate the contacts of the housing and the movable element so that no circuit is completed. The resilient devices are yieldable during the time when the object has its rate of movement changed to permit relative movement of the housing and the movable element so that the contacts move generally toward a closed position. A circuit is also provided for signalling that the device has detected a change of more than a prescribed amount in the rate of movement of the object. This signal occurs when the contact associated with the housing and the contact associated with the movable element are closed.

## 3,655,930
## MULTIPLE VACUUM SWITCH APPARATUS HAVING LONGITUDINAL ACTUATOR

Albert M. Frey, Portland, Oreg., assignor to Powerdyne Inc., Tualatin, Oreg.

Filed May 7, 1970, Ser. No. 35,483
Int. Cl. H01h 33/66
U.S. Cl. 200—144 B 14 Claims




A high voltage switch apparatus is described employing a plurality of vacuum switches mounted in radially spaced positions about a common actuator rod whose movable contacts are operated by longitudinal movement of the actuator rod. Each of the switches has a toggle operating mechanism for quick opening and closing of the switch contacts substantially parallel to the movement of the actuator rod. The operating levers of such toggle mechanisms are each connected through a lost motion coupling to a common actuator plate for rotation of such levers by longitudinal movement of such plate by the actuator rod. A closing spring provided on the lost motion coupling is preloaded by movement of such coupling relative to the operating lever until the opposing force applied to such lever by a toggle latching spring is overcome, and then such closing spring causes rapid closure of the switch contacts.

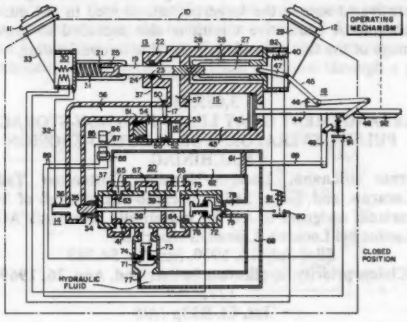
## 3,655,931
## SYNCHRONOUSLY OPERATING CIRCUIT BREAKER WITH IMPROVED CIRCUIT BREAKER OPERATING MECHANISM

Robert Ray Circle, Woodbridge, Va., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 19, 1970, Ser. No. 12,713
Int. Cl. H01h 33/90, 35/38
U.S. Cl. 200—148 J 16 Claims

A circuit breaker has normally closed main contacts and normally open secondary or synchronous contacts. For low current interruption, the main contacts open the circuit.

When a high fault current occurs, the secondary contacts are closed before the main contacts are opened. The secondary contacts are then opened just prior to a current zero after the opening of the main contacts. The secondary contacts are operated by hydraulic means having a driving piston actuated by the same mechanism which operates the main contacts and a puffer piston. Sliding valves and repulsion coil actuated




valves in the hydraulic means cooperate to control the operation of the driven piston, which operates the moving secondary synchronous contact. The energerization of the repulsion coils is controlled by current-responsive means and a synchronous control device. A synchronous operator controls a valve to direct the flow of gas from the puffer to either the main or the secondary contacts.

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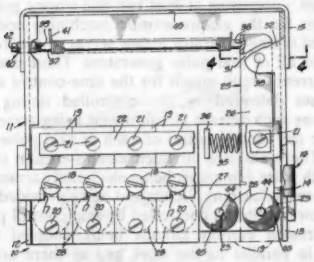
**3,655,932**

## SWITCHING DEVICE WITH CAMS PIVOTAL ABOUT AN AXIS PARALLEL TO THE PLANE OF MOVEMENT OF SWITCH PLUNGERS

**Gilbert Tabares, Panorama City, and Joseph Clifford, Corona, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.**

**Filed July 16, 1970, Ser. No. 55,451**
**Int. Cl. H01h** *3/42, 37/48*
**U.S. Cl. 200—153 LA** **3 Claims**



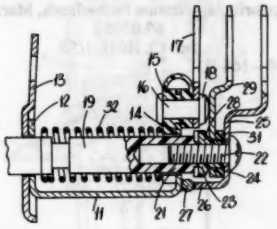
A mechanism to operate a plurality of pairs of plunger actuable switch contacts in sequence wherein the plungers are pins axially slidable for switch actuation. A plurality of shafts are threaded through a pivoted lever. Each shaft carries a frusto-conical cam to engage one end of a corresponding pin. All the pin, shaft and cam axes are parallel, the lever being movable on a frame in a direction perpendicular to the said axes. Threaded engagement of the shafts with the lever makes possible individual adjustment for calibration. It is thus possible to determine when each switch is actuated without complete disassembly.

**3,655,933**

## ELECTRICAL SWITCHES

**Peter Watson Leighton, Burnley, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England**

**Filed July 15, 1970, Ser. No. 55,024**
**Claims priority, application Great Britain, Aug. 11, 1969, 40,008/69**
**Int. Cl. H01h** *3/12*
**U.S. Cl. 200—159 R** **4 Claims**



An electrical switch includes a pair of fixed contacts, an operating member movable relative to the fixed contacts, and a pair of movable contacts carried by the operating member and engageable with the fixed contacts respectively in an operative position of the switch, one of said four contacts being capable of movement when engaged by its respective mating contact and being arranged to be engaged by its respective mating contact fractionally before the remaining pair of contacts mate, so that both movable contacts can be engaged with their respective fixed contacts in the operative position of the switch.

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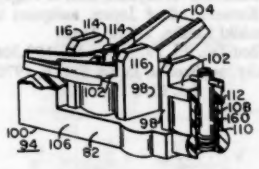
**3,655,934**

## MOVABLE CONTACT STRUCTURE FOR AN ELECTRIC SWITCH

**Merlin Y. Turnbull, Brookfield, Wis., assignor to Square D Company, Park Ridge, Ill.**

**Original application July 23, 1969, Ser. No. 844,151, now Patent No. 3,597,562. Divided and this application Nov. 9, 1970, Ser. No. 88,046**
**Int. Cl. H01h** *1/02*
**U.S. Cl. 200—166 C** **4 Claims**



A movable contact structure having a movable contact member carried on a movable contact carrier by a spring biased rotatable plunger. The contact member has a channel-like cross section and is formed of at least two laminated metals each having different deflection and conductive characteristics so that the weight of the contact member may be reduced and provide a maximum conductive ability commensurate with its resistance to bending. An end of the plunger extends through a notched opening in the contact member so that when the plunger is rotated to one position the contact member may be separated from the carrier and when the plunger is rotated to a second position, a pin on the end of the plunger engages the material of the contact member to maintain the contact member on the end of the plunger. The plunger also includes a portion that acts as a

piston in a bore of the contact carrier to reduce the bounce which occurs when the movable contact surfaces on the contact member initially engage the stationary contacts.

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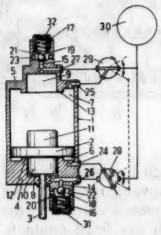
**3,655,935**

## GAS PRESSURE DAMPER MEANS FOR A CIRCUIT BREAKER MECHANISM

**Jan P. Houben, Aldenhof, Netherlands, assignor to N.V. COQ, Utrecht, Netherlands**

**Filed Mar. 10, 1970, Ser. No. 18,084**
**Claims priority, application Netherlands, Mar. 14, 1969, 69.03953**
**Int. Cl. H01h *1/50***
**U.S. Cl. 200—166 H** **8 Claims**



A piston operating in a cylinder is driven by gas pressure to one or the other of two end positions corresponding respectively to open and closed conditions of a circuit breaker. Oppositely projecting reduced area portions of the piston project into recesses at either end of the stroke to trap gas ahead of these portions to retard and substantially to stop the piston at each end of its stroke as it reaches stops delineating such ends of the strokes. A check valve is associated with each recess to allow the stop motion and prevent rebound and the relief pressure of each valve is varied in accord with pressure fluctuations in the driving gas supply so that the retarding and stop motion effects are adjusted to the piston speed as affected by the driving gas pressure.

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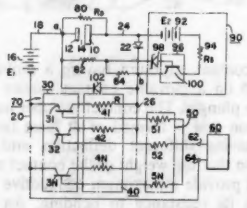
**3,655,936**

## APPARATUS FOR ELECTROEROSIVELY ETCHING A WORKPIECE

**Nagao Saito; Kazuhiko Kobayashi, both of Nagoya, and Susumu Niwa, Komaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Jan. 25, 1971, Ser. No. 109,306**
**Claims priority, application Japan, Feb. 6, 1970, 45/10536**
**Int. Cl. B23p *1/08***
**U.S. Cl. 219—69 C** **8 Claims**



A circuit for an electroerosive etching apparatus is disclosed which includes first and second direct current sources controlled by first and second switching circuits, respectively. The first switching circuit includes a plurality of switching elements, all of which are connected in parallel to facilitate the delivery of large currents and a pulse source for controlling the switching elements. The second switching circuit may include only one switching element, and is designed to supply only small currents. In operation, the first and second switching circuits initially cooperate to apply a potential nearly equal to the combined potentials of the two direct current sources across a working gap. Once a discharge is achieved using this high potential, the second switching circuit is automatically cut off, leaving the first switching circuit operative to supply the large current needed in the etching operation. A protective circuit is also included to prevent damage of the first switching circuit due to overloading.

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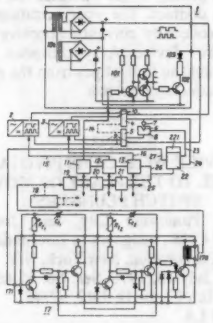
**3,655,937**

## ARRANGEMENT OF AT LEAST TWO NON-STORAGE PULSE GENERATORS FOR ELECTRO-EROSION MACHINING

**Werner Ullmann, Locarno-Muralto; Costantino Tadini, Locarno, and Ehsan Salim, Locarno-Muralto, all of Switzerland, assignors to AG fur industrielle Elektronik AGIE, Losone bei Locarno, Losone, Switzerland**

**Filed July 13, 1970, Ser. No. 54,383**
**Claims priority, application Switzerland, Aug. 26, 1969, 12924/69**
**Int. Cl. B23p *1/08***
**U.S. Cl. 219—69 P** **5 Claims**



A circuit arrangement for electro-erosion machining operations, comprising at least two non-storing pulse generator means for the electro-erosion machining operations. A controlled timing generator means serves to generate control pulses for all of said pulse generators. There are also provided current circuit means for the time-control of the control pulses delivered by the controlled timing generator means, one such current circuit means being arranged at the input for the control pulses of each of said pulse generator means. There also are provided electro-erosion current circuits, with pulse generators being electrically arranged in said electro-erosion current circuits and being provided with electronic power switches controlled by said control pulses, said electro-erosion current circuits being coupled in such a number in parallel to the work gap as there are required working pulses of different amplitudes for producing a working spark.

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**3,655,938**

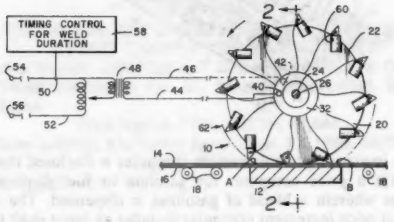
## DYNAMIC SPOT WELDER

**Robert J. Roberts, 9833 Moyers, Houston, Tex.**

**Filed Apr. 22, 1970, Ser. No. 30,874**
**Int. Cl. B23k *11/10***
**U.S. Cl. 219—87** **9 Claims**

Dynamic electrical resistance spot welding apparatus according to the present invention comprises a support that

may be of linear or circular configuration and defines an elongated work station. Strip material to be spot welded moves continuously through the work station and may be wound about a circular mandrel that may form the support. A rotatable welding element which may be a wheel is disposed with its periphery adjacent the work station and is provided with a plurality of recesses formed about the periphery thereof. Each recess retains a welding head in movable relation therein that is biased outwardly away from the recess so that the welding head may move against the bias upon contacting the material to be welded. Each welding head is provided with a pair of electrodes that are connected electrically to a source of electrical potential through a pair




of brushes carried by the welding element. The electrical circuitry is completed upon engagement between the electrodes and the material and welding is accomplished by heat developed by the electrical current passing through the resistance defined by the material. The welding heads engage the material in such manner that mechanical pressure is varied throughout movement of the material through the work station to achieve heating, fusion, and solidification of the material under mechanical pressure as it moves through the work station. Additionally, the electrical circuitry may be provided with a timing control to achieve heating and cooling of the material as it moves through the work station if desired.

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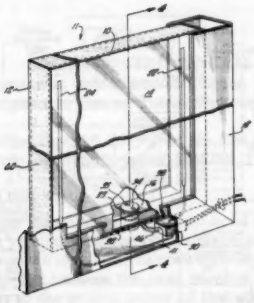
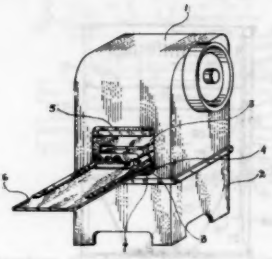
**3,655,939**
**SAFETY DEVICE FOR MULTI-PANE GLASS REFRIGERATOR DOORS**
**Michael E. Stromquist, Studio City, Calif., assignor to Anthony's Manufacturing Company, Inc.**
**Filed Nov. 16, 1970, Ser. No. 89,882**
**Int. Cl. H05b 1/00**
**U.S. Cl. 219—218** **9 Claims**



A safety device for a multi-pane electrically heated glass refrigerator door. The glass unit forms a pressurized chamber. A pressure sensor and associated circuit breaking means removes electrical power from the door when damage to the unit causes the pressure within the chamber to vary.

**3,655,940**
**HEATED DIE CARRIER**
**Donald F. Robinson, Rustic Lane, Plaistow, N.H.**
**Filed Sept. 4, 1970, Ser. No. 69,545**
**Int. Cl. H05b 1/00**
**U.S. Cl. 219—243** **9 Claims**



An Apparatus for use with a reciprocating press for feeding pieces of leather into and from between the press elements. The pieces of leather are thus cut into desired shapes and ornamented by punching designs such as stitching marks and holes there through to provide portions of shoe tops, belts and other articles. The device for feeding such pieces of leather is an electrically heated, cutting die supporting carrier or vehicle which rides on a supporting guide plate with track elements thereon. The supporting plate is fixed to the stationary element of the press. The carrier or vehicle is supported on the guide plate by spring urged rollers which yield under pressure when the pieces of leather are being operated upon the press. The carrier is moved manually on the supporting guide plate from a loading and discharge position in front of the press to punching position within the press.

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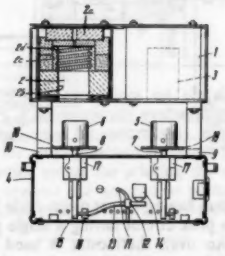
**3,655,941**
**DENTAL CERAMIC FIRING OVENS**
**Wolfgang Eugen Schaun, Buchschlag, Germany, assignor to Dentsply International Inc., York, Pa.**
**Filed Dec. 22, 1970, Ser. No. 100,560**
**Int. Cl. F27b 5/14**
**U.S. Cl. 219—390** **3 Claims**

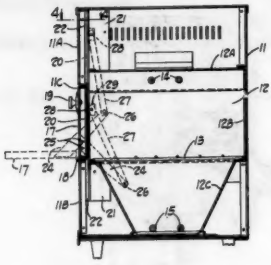


A dental firing oven of a compound type having two firing chambers in an upper housing and respectively provided for (1) firing porcelain dental products into fused condition and for (2) effecting preliminary burning of expendable materials, such as binders for the porcelain particles. The firing chambers open downwardly to receive products supported on product carriers movable toward and from a lower housing in which control and actuating mechanism is mounted for actuating said product carriers.

## 3,655,942
## OVEN WITH CLOSURE MECHANISM

Raymond F. Tomsic, Willoughby, Ohio, assignor to Spectrum Infrared, Inc., Cleveland, Ohio

Filed Mar. 12, 1971, Ser. No. 123,780
Int. Cl. F27d *11/02*
U.S. Cl. 219—405 15 Claims

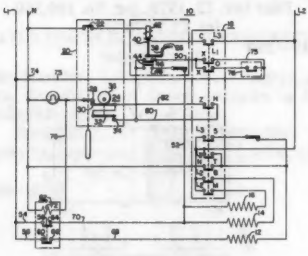


An oven provided with inner and outer doors arranged so that when both doors are registered with the oven opening to cover the opening the inner door is disposed inwardly of the oven from the outer door to reflect oven heat from the outer door, and the two doors being so connected that movement of the outer door to and from a position covering the opening automatically and concurrently causes the inner door to correspondingly move to and from a position covering the opening.

## 3,655,943
## SINGLE POLARITY OVEN CONTROL

Calvin J. Holtkamp, Mansfield, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 15, 1970, Ser. No. 28,677
Int. Cl. H05b *1/02*
U.S. Cl. 219—491 4 Claims

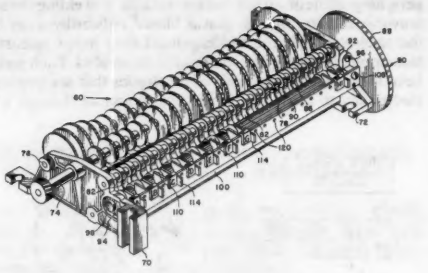


An oven system having a heat clean cycle is disclosed that utilizes a single peak circuit having a single polarity thermal power relay. An oven thermostat is used to provide the required dialed in temperature for heat cleaning and this thermostat includes a cam arrangement actuating a movable contact which is closed for normal cooking temperatures and which is open for oven cleaning purposes. The contact is shunted in latch and clean modes to insure that the multi-terminal selector switch is set for proper oven circuitry whenever the thermostat is set for an upper temperature limit. The single polarity thermal relay is connected in series circuit relationship to the oven heaters for broil, fast broil and bake and opens upon attainment of the temperature peak utilized for cleaning purposes.

## 3,655,944
## PRICE COMPUTER

Dana W. Nelson, Dexter, Ohio, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jan. 13, 1971, Ser. No. 106,218
Int. Cl. B67d *5/22*
U.S. Cl. 235—61 M 8 Claims

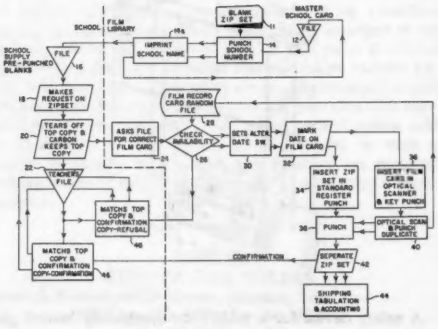


An improved price increment computer is disclosed that is used in a price computer for gasoline or fuel dispensing pumps wherein a blend of gasolines is dispensed. The improved price increment computer includes an input shaft that rotates in response to the total volume of blended fluid being dispensed and an output shaft that rotates at speeds proportional to the speed of the input shaft. An idler mechanism is provided that selectively and operably connects portions of the input and output shafts to provide the desired ratio of rotation therebetween. A selector mechanism that is rotated by the operator of the dispenser includes a plurality of cams, each of which engages a preselected portion of the idler mechanism to provide the desired output rotation depending on the price of the blend selected. The improved price increment computer is constructed so that the selector mechanism can be quickly and easily removed from the price increment computer to provide for the insertion, removal or repositioning of the cams whereby price changes and variations can be quickly and easily accomplished.

## 3,655,945
## ITEM SCHEDULING SYSTEM AND APPARATUS THEREFOR

Howard Bowen, Wilmette; David L. Henderson, Mundelein, and Richard R. Wallace, Wilmette, all of Ill., assignors to The Harwald Company, Inc., Evanston, Ill.

Filed Mar. 24, 1969, Ser. No. 809,915
Int. Cl. G06k *1/04, 7/14;* H02k *17/58*
U.S. Cl. 235—61.1 20 Claims


BLANK ZIP SET
MASTER SCHOOL CARD
SCHOOL
FILM LIBRARY
IMPRINT SCHOOL NAME
PUNCH SCHOOL NUMBER
SCHOOL SUPPLY PRE-PUNCHED BLANKS
FILE
MAKES REQUEST ON ZIPSET
FILM RECORD CARD RANDOM FILE
TEARS OFF TOP COPY & CARBON KEEPS TOP COPY
ASKS FILE FOR CORRECT FILM CARD
CHECK AVAILABILITY
SETS ALTER DATE SW
MARK DATE ON FILM CARD
TEACHERS FILE
INSERT ZIP SET IN STANDARD REGISTER & KEY PUNCH
INSERT FILM CARD IN OPTICAL SCANNER & KEY PUNCH
MATCHES TOP COPY & CONFIRMATION COPY-CONFIRMATION
MATCHES TOP COPY & CONFIRMATION COPY-REFUSAL
PUNCH
OPTICAL SCAN & PUNCH DUPLICATE
CONFIRMATION
SEPERATE ZIP SET
SHIPPING TABULATION & ACCOUNTING

A film scheduling or booking system is provided in which pre-punched zip sets are employed for film selection and are

compared with a master film card to determine whether the requested date is available. The requested date is then marked on the film card in an area arranged as a 365-day calendar. The marked areas on the master film card are optically scanned and both the master film card and the zip set are punched in the marked areas, all in the same operation. The master film card is provided with a reference area ahead of the calendar area and the output of the twelve channels of the optical scanning circuits are all automatically set to a fixed reference level so that thermal drift or saturation of the sensing devices in either the plus or minus direction does not produce improper punching.

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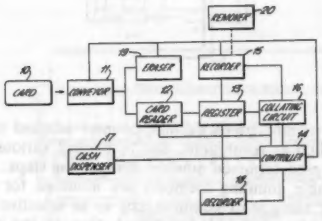
## 3,655,946
## SYSTEM FOR DISPOSING OF INVALID CARDS IN A CREDIT CARD SYSTEM OR THE LIKE

**Tadao Morita, and Masanori Nagata, both of C/o Omron Toteisi Electronics Co. 20, Igadera Shimokalinji, Kyoto, Japan**

**Filed Sept. 2, 1970, Ser. No. 68,840**
**Claims priority, application Japan, Sept. 11, 1969, 44/72138**
**Int. Cl. G06r** *5/00*
**U.S. Cl. 235—61.7 B** **1 Claim**




A system for disposing of invalid cards in a credit card system or the like, wherein the identification numbers of those of the cards issued which have become invalid are recorded in the system, so that if the identification number of a card presented to the system agrees with any one of the recorded invalid card numbers, that card is recognized as invalid and the identification number written on the card is erased therefrom and at the same time the corresponding number is removed from the record in the system.

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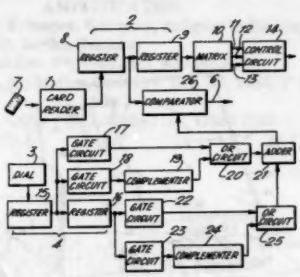
## 3,655,947
## IDENTIFICATION SYSTEM

**Mititaka Yamamoto, and Masanori Nagata, both of Kyoto, Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan**

**Filed Sept. 10, 1969, Ser. No. 856,576**
**Claims priority, application Japan, Sept. 19, 1968, 43/67902**
**Int. Cl. G06k** *5/00*
**U.S. Cl. 235—61.7 B** **5 Claims**

A system for identifying the proper user of a credit card or the like in a vending machine or the like. Each card used in the system is given two different code numbers, one of which is written on the card as the card number with the other being known to the proper owner of that card as its secret number. When a card is introduced into the system, the user of the card enters into the system its secret number by means of a dial or the like. There are provided in the system several types of operation, one of which is selected in accordance with the card number of the introduced card and the selected type of operation is conducted on the secret number. The result of the operation is compared with a predetermined number and when correspondence between the card number and the secret number is recognized on the basis of the result




of the comparison, the user of the card is identified as the proper owner of that card.

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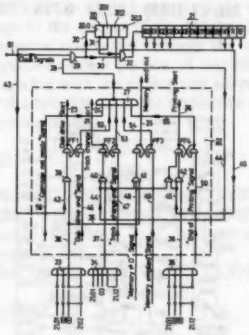
## 3,655,948
## APPARATUS FOR AUTOMATICALLY EVALUATING RECORDINGS ON A RECORD CARRIER

**Siegfried Spauszus, Villingen, Germany, assignor to Kienzle Apparate GmbH, Villingen, Germany**

**Filed Apr. 16, 1970, Ser. No. 29,018**
**Claims priority, application Germany, Apr. 26, 1969, P 19 21 456.3**
**Int. Cl. G06k** *3/00;* **E04g** *17/00*
**U.S. Cl. 235—61.9 R** **15 Claims**



Circular concentric recordings on circular tracks of a record carrier, are automatically evaluated by an apparatus including sensing means for successively sensing each track, storage means for storing sensed information as numerical values, and printing means for printing the values. Program control means control the successive performance of the sensing, storing, and printing functions of the apparatus.

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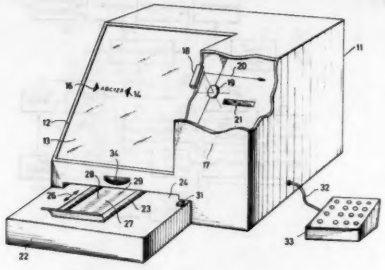
## 3,655,949
## DATA PROCESSING EQUIPMENT

**Jurgen Rinn, Heuchelheim, Germany, assignor to Minox G.m.b.H., Ludwig Rinn Str., Giessen, Germany**

**Filed June 23, 1969, Ser. No. 835,458**
**Claims priority, application Germany, Sept. 13, 1968, P 17 74 818.4**
**Int. Cl. G06k** *7/10*
**U.S. Cl. 235—61.11 E** **2 Claims**

A feeding arrangement moves microfilm under an optical reading head. At the same time corresponding information in readable form is projected onto a predetermined position on

a ground glass plate visible to an operator. Means are provided for initiating the reading process and to output it for



further processing. An auxiliary keyboard adds other data to the output.

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**3,655,950**

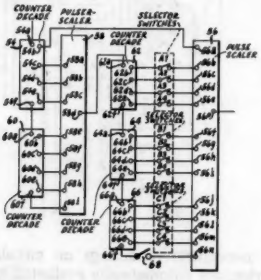
**PERCENTAGE ELONGATION CALIBRATED DIGITAL PULSE DELETER**

**Donald J. Greening, Theinsville; Paul M. Kintner, Bayside, and Sanford M. Strand, West Allis, all of Wis., assignors to Cutter-Hammer, Inc., Milwaukee, Wis.**

**Filed Oct. 22, 1969, Ser. No. 868,305**

**Int. Cl. H03k** *13/258;* **B21b** *37/00*

**U.S. Cl. 235—92 PE** **7 Claims**



A digital pulse deleter for use with digital control systems of electric motors driving work stand rolls in processing lines to afford selective adjustment of motor speeds calibrated in terms of percentages of elongation between successive work stands. The deleter can be adjusted by readily made changes in electrical interconnections to be determinative of what percentage of input pulses will and what percentage of such pulses will not be subject to deletion by selector switches. Operation of the selector switch permits selection of the increments of pulses subject to deletion that will be actually deleted with such increments being calibrated as a percentage or a per unit value of elongation or draw. The percentage of total deleter input pulses not subject to deletion is determinative of the maximum elongation or draw ratio to which the deleter will be so calibrated.

**3,655,951**

**ELECTROIMPULSIVE DECIMAL COUNTER**

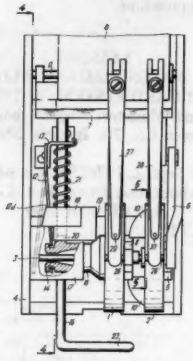
**Miroslav Vach, Brno, Czechoslovakia, assignor to Elitex-Zavody textilniho strojirenstvi, generalni reditelstvi, Liberec, Czechoslovakia**

**Filed Nov. 17, 1969, Ser. No. 877,139**

**Claims priority, application Czechoslovakia, Nov. 28, 1968, 8099-68**

**Int. Cl. G06m** *3/02, 1/28*

**U.S. Cl. 235—92 C** **5 Claims**



An electrically driven decimal counter adapted to count motions such as revolutions, and to control various operations in a predetermined number of repeating steps. At least two rotatable counting members are mounted for relative movement along their common axis so as selectively to be drivingly connected and disengaged. One of the counting members carries means for controlling a first switch mechanism for transferring impulses to the next stage of the counter, such switch mechanism also receiving zeroing impulses. The other counting member has a means for controlling a second switch mechanism, which is adapted to be interposed in an electric circuit for a machine. The mechanism for disengaging the one counting member from the second constitutes a mechanical controlling member for the second counting member.

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**3,655,952**

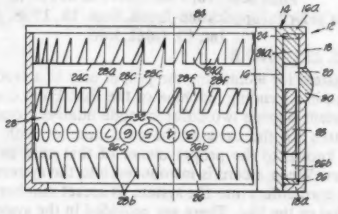
**LIQUID DISPENSER COUNTING MECHANISM**

**Robert J. Johnson, Culver City, and Walter J. Zipper, Santa Monica, both of Calif., assignors to Portion-Trol Liquor Systems, Inc.**

**Filed Mar. 15, 1971, Ser. No. 124,235**

**Int. Cl. G06m** *1/00;* **B67d** *5/22*

**U.S. Cl. 235—94 R** **8 Claims**



A counting device sensitive to change of position of a body involves two spaced stationary notched rings between which

a ring notched along both of its edges moves. The cooperation between the notches of the spaced stationary rings and the movable ring is such that when the stationary structure is inverted or tilted, the movable member advances a predetermined distance, and it carries the sequence of numbers, one of which is visible, to indicate the number of such inversions or tilts.

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**3,655,953**

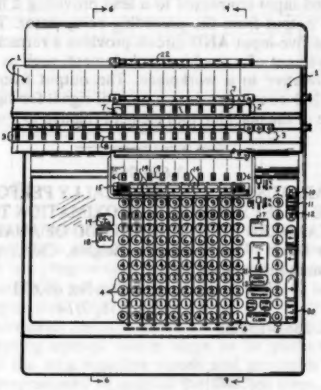
## CARRY MECHANISMS FOR CALCULATING MACHINES

**William S. Gubelmann, deceased, late of Convent, N.J., and Walter S. Gubelman, executor, Oyster Bay, N.Y., assignors to Realty & Industrial Corporation, Morristown, N.J.**

**Continuation of application Ser. No. 168,595, Jan. 22, 1962, now abandoned , which is a continuation of application Ser. No. 69,227, Nov. 14, 1960, now abandoned , which is a division of application Ser. No. 194,273, Nov. 6, 1950, now Patent No. 2,969,177. This application June 4, 1969, Ser. No. 831,823**

**Int. Cl. G06c *15/26***

**U.S. Cl. 235—137** **53 Claims**



Carry transfer mechanism for mechanical registers of calculating machines, including such mechanism capable of performing two primary transfers in a single registration. Two primary transfers may occur, when a units and tens of an integrated partial product are registered in a single order of a register that already indicated a number, for example the units amount (9) of one order may be integrated with a tens amount (8) of the next lower order and in one motion the integrated amount (17) may be entered into one register order that stands at more than 3 (4 for example), and, for the register to indicate (9+8+4), the one register order is rotates twice past primary transfer position and the next higher order of the register unit must be advanced twice in one registration operation. A mechanism cooperating with the above mechanism for completing simultaneously any consecutive transfers that may not normally be complete at the end of a registration operation. Simultaneous transfer mechanism for operating outboard orders of a carriage borne register. Simultaneous transfer mechanism for a counter that may also register quotients and multipliers.

**3,655,954**

## CLOSED LOOP CONTROL SYSTEM WITH AUTOMATIC VARIATION OF ITS REGULATING FEEDBACK AMPLIFICATION

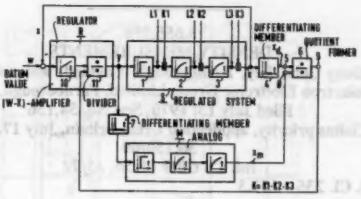
**Winfried Speth, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany**

**Filed Dec. 17, 1969, Ser. No. 885,691**

**Claims priority, application Germany, Dec. 20, 1968, P 18 15 964.3**

**Int. Cl. G05b *17/02*; G06g *7/18*; G069 *7/48***

**U.S. Cl. 235—150.1** **16 Claims**




In a closed-loop control system the regulated system portion has a number ($n$) of integration members. The regulator feedback which is connected between output and input of the regulated system portion comprises regulator control means for automatically adapting the amplification of the regulator to variations in amplification occurring in the regulated system portion during operation of the latter. The regulator control means comprise a first differentiating stage of the ($n$+1)-th order, an at least partial analog of said regulated system portion, a quotient-forming divider having two inputs of which one is connected through the first differentiating stage to the output of the regulated system portion and the other is connected through the analog to the input of the regulated system portion. A second differentiating stage is connected with the analog and adapted for phase coincidence of the two signals at the respective two inputs of the quotient-forming divider.

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**3,655,955**

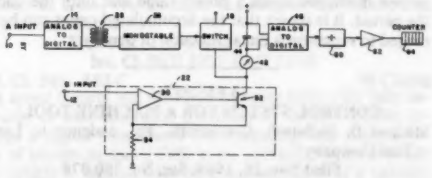
## RECORDING AND INDICATING SYSTEM PARTICULARLY FOR LOCOMOTIVES AND THE LIKE

**Thomas A. Brendle, Hamburg, N.Y., assignor to Audn Corporation, Hamburg, N.Y.**

**Filed Feb. 20, 1970, Ser. No. 13,070**

**Int. Cl. G06g *7/16***

**U.S. Cl. 235—150.52** **12 Claims**




A system for providing signals indicative of the instantaneous power output and the time integral of power output in both analog and digital form. The analog signal indicative of the instantaneous power output is obtained by providing a switch-controlling digital signal whose frequency is linearly proportional to the instantaneous amplitude of the voltage applied to the d.c. traction motor and whose pulse durations are of fixed value. The controlled switch is normally closed and is connected in shunt with an averaging circuit so that

the switch normally short circuits the averaging circuit and provides a path for a current source whose output is linearly proportional to the current supplied to the motor. The averaging circuit, which includes a d.c. current meter, sees a digital signal whose frequency is modulated according to the supplied voltage and whose amplitude is modulated according to the instantaneous current. An integrating capacitor in the averaging circuit drive a relaxation oscillator to provide a digital signal whose frequency is linearly proportional to the instantaneous power so that integration of this signal yields an indication of power-hours. An improved amplifier particularly suitable for accurate amplification of small signals is provided also.

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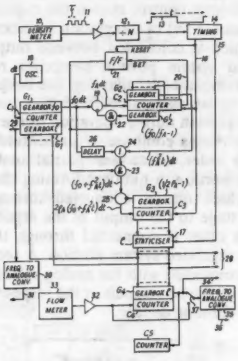
**3,655,956**

## DENSITY MEASUREMENTS

**Anthony John Ley, Farnborough, England, assignor to The Solartron Electronic Group Limited, Farnborough, England**

**Filed July 13, 1970, Ser. No. 54,136**
**Claims priority, application Great Britain, July 17, 1969, 36,159/69**
**Int. Cl. G06f *15/56, 15/34***
**U.S. Cl. 235—151.3** **7 Claims**




The output of a frequency domain density meter is linearized by feeding clock pulses via a first preset binary rate multiplier to a second binary rate multiplier whose gating logic is set by its own contents, thereby to effect squaring of the contents. Within one period of the density meter output, the output pulses from both binary rate multipliers are accumulated together, commencing when the contents of the second multiplier reach a preset value and until the end of the period. It is shown that the accumulated count can be arranged to represent a linear function of density.

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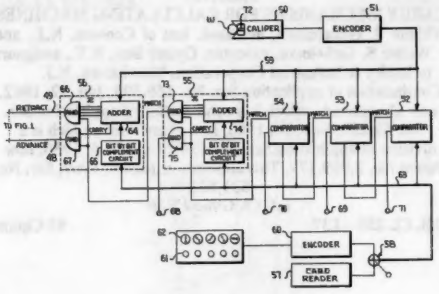
**3,655,957**

## CONTROL SYSTEM FOR A MACHINE TOOL

**Michael D. McIntosh, Greencastle, Pa., assignor to Landis Tool Company**

**Filed Nov. 26, 1969, Ser. No. 880,078**
**Int. Cl. G05b *1/01*; G06f *7/38***
**U.S. Cl. 235—151.11** **10 Claims**

A machine tool control system is described which includes an adder arranged to add a first binary number, representative of a sensed dimension of a workpiece, to the bit by ones complement of a second binary number, representative of a desired dimension of the workpiece. Whenever the first binary number is greater than the second binary number, at least one of the sum outputs from the adder represents a zero logic condition, and a one logic condition exists on the carry output from the adder. Whenever the first and second binary numbers are equal, the sum outputs from the adder results in all ones and the carry output is in a zero logic condition. The sum output connections from the adder are coupled to four inputs of a five-input AND circuit. The fifth input is connected to a lead providing a logical one output upon the match of the next preceding digit as determined by a preceding comparator. The carry output connection from the adder




is coupled to one input of a two-input AND circuit which has its second input connected to a lead providing a match logical one output from the preceding comparator. The output from the five-input AND circuit provides a retract signal for the movement of a machine tool element, such as a grinding wheel, relative to a workpiece. The output from the two-input AND circuit provides a control signal for signalling an advance of the machine tool element relative to a workpiece.

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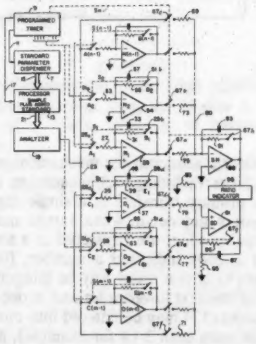
**3,655,958**

## APPARATUS FOR AUTOMATICALLY PERFORMING THE LEAST SQUARES APPROXIMATION TO THE STANDARD ADDITION METHOD OF ANALYSIS

**Charles David West, Hacienda Heights, Calif., assignor to Beckman Instruments Inc.**

**Filed June 25, 1970, Ser. No. 49,671**
**Int. Cl. G06g *7/58, 7/14***
**U.S. Cl. 235—151.35** **8 Claims**




An analyzer is connected to a processor into which a standard parameter is added in equal increments of known value to a process having a sample containing an unknown value of the standard parameter. A programmed timer is connected to a standard parameter dispenser and to the processor to initiate the parameter addition and analysis of the process by the analyzer respectively. In response to each parameter ad-

dition, the analyzer generates an electrical signal. A multiplicity of relay armatures are connected to the analyzer output to apply the signals from the analyzer in a predetermined sequence to each of a multiplicity of operational amplifiers connected as storage devices. Each of the outputs of the amplifiers are in turn connected to another plurality of armatures which connect each of the amplifier outputs in a specified combination to one of two summing amplifiers. The summing amplifiers are connected to a ratio indicator to display the ratio of the two amplifier outputs as the unknown value of the standard parameter contained in the sample.

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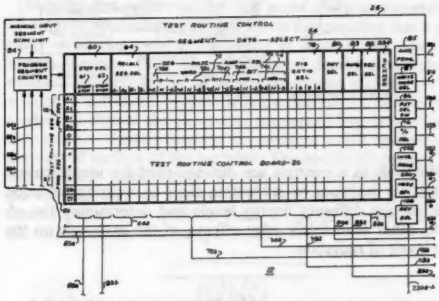
3,655,959
## MAGNETIC MEMORY ELEMENT TESTING SYSTEM AND METHOD

Gary Allen Chernow, Swarthmore, Pa., and Hyman Gail, Cherry Hill, N.J., assignors to Computer Test Corporation

Filed Aug. 17, 1970, Ser. No. 64,158
Int. Cl. G11c *29/00*
U.S. Cl. 235—153 45 Claims




A method and system for testing a magnetic memory element by applying a sequence of test routines in which each test routine is a programmed sequence to tests and analyses; each routine having programmed segments and each segment having programmed steps. A programmed test control provides test parameter and step selection control signals. A programmed timing control selects steps to be performed in response to the step selection signals and generates timing signals as programmed in each of the selected steps. A test pulse generator produces test signals in response to the test parameter control signals and the timing signals.

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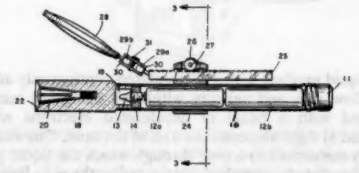
3,655,960
## INSTRUMENT FOR USE IN THE GRAPHIC ARTS

George C. Andree, 528 Willow Street, West Hempstead, N.Y.

Filed July 28, 1969, Ser. No. 845,279
Int. Cl. B43k *29/18*; F21v *33/00*
U.S. Cl. 240—6.46 2 Claims



An instrument for use in the graphic arts which comprises means for illuminating the work area, provides a magnified image of the work area and supports the tool needed for performing, retouching and silhouetting operations. The instrument can be held in one hand freeing the other hand for manipulation of the work and other tasks.

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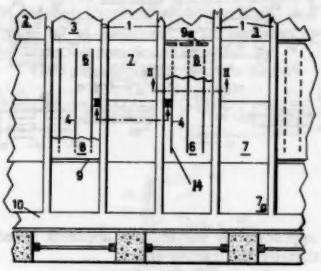
3,655,961
## CEILING STRUCTURE WITH LIGHTS

Borre Hover, Oslo, Norway, assignor to A/S Norsk Viftefabrikk, Oslo, Norway

Filed Feb. 9, 1970, Ser. No. 9,922
Claims priority, application Norway, Feb. 12, 1969, 551/69
Int. Cl. F21s *3/14*
U.S. Cl. 240—9 A 17 Claims



As a part of a ventilating or air conditioning system a plurality of parallel hollow carrier sections are arranged in spaced relation under a ceiling slab. Said hollow carrier sections are provided with upper and lower support means facing towards the space between said carrier sections. At least some of said upper means support carrier plates provided with lighting fixtures on the underside thereof. At least some of said lower means support transparent or translucent optical panels provided under and spaced from said carrier plates. Other of said lower means support acoustic panels, cover plates or the like. Air flow connection from the underlying room to the space between the carrier plates and the optical panels is ensured. The walls of the parallel hollow sections are provided with apertures being in air flow connection with the spaces between the carrier plates and the optical plates to cause the air flow from the underlying room when the ventilating system is in operation to ventilate the lighting fixtures on its way to the interior of the hollow section. The air flow stream may be reversed.

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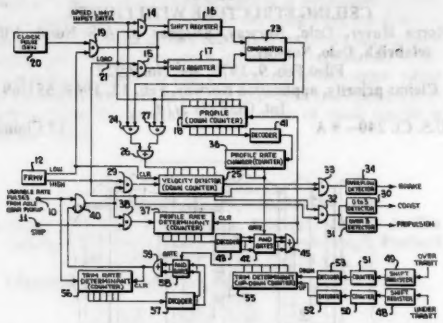
3,655,962
## DIGITAL AUTOMATIC SPEED CONTROL FOR RAILWAY VEHICLES

Bradley R. Koch, Woodbridge, Va., assignor to Melpar, Inc., Falls Church, Va.

Filed Apr. 1, 1969, Ser. No. 811,970
Int. Cl. B61l *3/08*; G06f *15/48*
U.S. Cl. 246—182 C 30 Claims

A speed control and precision stopping system for fully automatic or semi-automatic operation of railway vehicles includes a digital comparator for comparing data representative of maximum speed limit in the particular zone in which the vehicle is located with data representative of a velocity restriction imposed by a synthesized stopping profile mode. The stopping profile mode is based on the distance the vehicle must cover to reach the next scheduled stopping point, and is synthesized in the form of successive rates at which the vehicle velocity is reduced from an initial value corresponding to maximum speed limit. The lesser of the two compared speed restrictions is used as the desired vehicle speed and the actual vehicle speed is compared against this desired value to determine the sense and extent of tractive effort required to be exercised by the train controls to maintain the vehicle at

desired speed. Compensation is provided for successive vehicle stopping at points short of or beyond a preset stopping



target by appropriately varying the apparent speed of the train, and thereby, the tractive effort.

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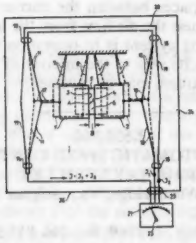
**3,655,963**

## DEVICE FOR CONTROLLING THE SLIT WIDTH OF ADJUSTABLE SLIT ELECTRODES IN MASS SPECTROMETERS

**Kurt Brunnee, Bremen-Platjenwerbe, and Feodor Otto Kramer, Bremen, both of Germany, assignors to Varian Mat GmbH, Bremen, Germany**

**Filed Dec. 1, 1969, Ser. No. 881,191**
**Claims priority, application Germany, Dec. 4, 1968, P 18 12 625.5**
**Int. Cl. H01j *39/34***
**U.S. Cl. 250—41.9 D** **5 Claims**



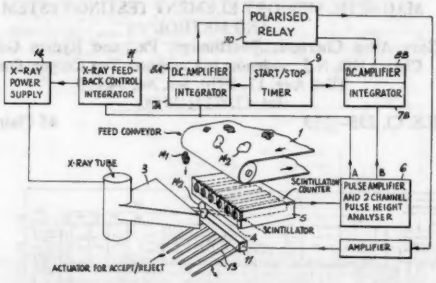
The slit width defined by a pair of slit electrodes in a mass spectrometer is controlled by means of a pair of hot wires, one being coupled to each slit electrode. Each wire extends about two spaced supporting elements and a tensile bar is used to couple a midpoint of each hot wire to its respective electrode. A temperature control arrangement is also used and includes a heating wire coupled to all supporting elements to maintain the temperature of the supporting elements constant as the current in the hot wires is changed to vary the slit width. This type of operation is provided by connecting both the hot wires and heating wire to an electrical regulating device that maintains the sum of the currents in these wires at a constant value.

**3,655,964**

## IONIZING RADIATION APPARATUS AND METHOD FOR DISTINGUISHING BETWEEN MATERIALS IN A MIXTURE

**David Laurie Slight, North Mains, Ormiston, East Lothian, Scotland**

**Continuation-in-part of application Ser. No. 433,705, Feb. 18, 1965, now abandoned. This application May 6, 1968, Ser. No. 726,928**
**Int. Cl. G01n *23/12***
**U.S. Cl. 250—43.5 D** **8 Claims**




Materials in a mixture are distinguished for identification or sorting purposes by subjecting them to ionizing radiation at least two different energy levels and determining the effects, other than solely edge effects, of the materials on the two levels of radiation.

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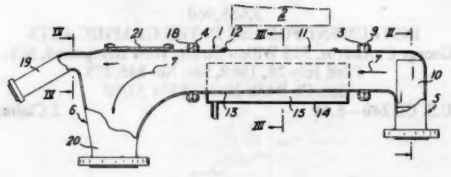
**3,655,965**

## IRRADIATION CELL FOR IRRADIATING A CONTINUOUSLY FLOWING LIQUID WITH AN ELECTRON BEAM

**Pierre Icre, Versailles, and Jacques Laizier, Vincennes, both of France, assignors to Commissariat A L'Energie Atomique, Paris, France**

**Filed Jan. 20, 1970, Ser. No. 4,341**
**Claims priority, application France, Feb. 6, 1969, 6902640**
**Int. Cl. G01n *21/28, 23/14***
**U.S. Cl. 250—45** **4 Claims**

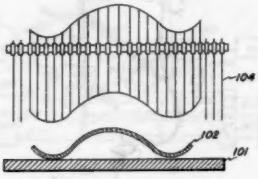


A liquid product which is circulated continuously at a variable flow rate and velocity within an elongated tank is irradiated with a beam of accelerated electrons which is directed at right angles to the axis of the tank. One end of the tank is connected to a pipe through which the liquid product to be irradiated is supplied continuously, the pipe being fitted with means for distributing the flow of liquid within the tank. The other end of the tank is connected to a discharge duct having an overflow orifice and a discharge spout fitted with a valve for regulating the depth of liquid within the tank.

## 3,655,966
## ELECTRIC CHARGING DEVICE FOR ELECTROPHOTOGRAPHY

Masaaki Takimoto; Masamichi Sato, and Satoru Honjo, all of Asaka, Japan, assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 3, 1970, Ser. No. 86,493
Claims priority, application Japan, Nov. 8, 1969, 44/89423
Int. Cl. G03g *13/00, 15/00*
U.S. Cl. 250—49.5 ZC 13 Claims

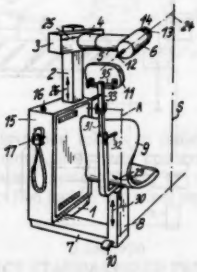



Method and apparatus for uniformly charging the surface of a curved insulating member. A carrier member has a plurality of joining members disposed at substantially equal intervals thereon. Each of a plurality of needle electrodes is retained respectively by an associated joining member. When a force of sufficient magnitude is exerted on the needle electrodes, the tips of the electrodes are forced into contact with the member, the tips forming an envelope which conforms to the curved surface of the member. The needle electrodes are subsequently withdrawn to a predetermined position above the surface and an electric discharge potential is applied thereto, whereby a uniform electric charge is deposited on the surface of the insulating member.

## 3,655,967
## X-RAY DIAGNOSTIC DEVICE HAVING A PATIENT CHAIR AND AN X-RAY SOURCE WHOSE RELATIVE ORIENTATION IS CONSTANT

Johann Finkenzeller, 8521 Brucher Str. 32, Tennenlohe, and Artur Schmidt, 8520 Membacher 22, Erlangen, both of Germany

Continuation-in-part of application Ser. No. 666,285, Sept. 8, 1967, now abandoned. This application June 11, 1970, Ser. No. 45,484
Int. Cl. G03b *41/16*
U.S. Cl. 250—50 9 Claims

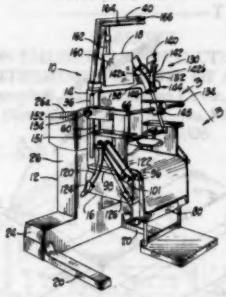


X-ray diagnostic apparatus including a chair for the patient having a vertical plane of symmetry in which lies the central X-ray beam. The chair has a headrest which may be adjusted into a fixed position for the head of the patient and is supported on an arm extending from the base and in the plane of the base and is spaced a fixed distance from a column supporting the X-ray emitter. A horizontal boom arm extends from the column and is carried by a carrier member extending parallel to the vertical plane of symmetry of the chair. The boom arm is adjustable along said carrier member toward and from the chair. The horizontal boom arm is adjustable about its longitudinal axis. The X-ray emitter is carried in a protective casing extending perpendicular to the boom and is positioned to lie in the vertical plane of symmetry of the chair. The boom and chair are vertically adjustable and the chair is pivotally movable about a vertical axis extending along the vertical plane of symmetry of the chair.

## 3,655,968
## X-RAY EXAMINATION CHAIR

Robert M. Moore; Norman H. Lauterbach, and David P. Armstrong, all of Richmond, Va., assignors to Kermath Manufacturing Corporation, Richmond, Va.

Filed June 29, 1970, Ser. No. 50,869
Int. Cl. H01j *37/20*
U.S. Cl. 250—50 13 Claims



An X-ray examination chair is disclosed which is capable of swiveling and tumbling so that a patient restrained in the chair is positionable in various desired orientations for X-ray examination procedures.

The chair includes an adjustable X-ray film cassette holder mounted for swiveling about the chair's swivel axis and relative to the chair. The cassette holder is tumbled with the chair so that the cassette holder is readily positioned for X-ray exposures regardless of the chair orientation.

Restraints against undesired movement of the patient in the chair include a removable arm and thigh restraining means and an adjustable head restraint structure.

A restraining device for a child which positions a child for X-ray exposures adjacent the cassette holder is also disclosed.

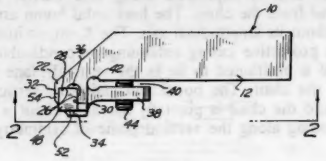
## 3,655,969
## CUTTING TOOL

Bernard M. Pollington, 22600 Middlebelt, Farmington, Mich., and Leslie W. Pollington, 19410 Rennesellor, Livonia, Mich.

Continuation-in-part of application Ser. No. 710,259, Mar. 4, 1968, now Patent No. 3,523,349, dated Aug. 11, 1970. This application Aug. 7, 1970, Ser. No. 62,046
Int. Cl. B26d *1/00*
U.S. Cl. 29—96 9 Claims

A cutting tool for shapers, lathes and the like including a holder having a pair of gripping jaws formed at the intersection of two sides of the holder. The holder is provided with a slot disposed with respect to the gripping jaws such that widening of the slot causes the gripping jaws to be moved towards each other to securely clamp an elongated rectangular cutting tool insert therebetween, the insert having its

cutting edge disposed on opposite ends thereof so that when one cutting edge becomes dull the insert can be reversed to present the other cutting edge. A screw engages the lower



end of the insert to provide an adjustment for the insert and a second screw provides the means for widening the slot to lock the insert in position.

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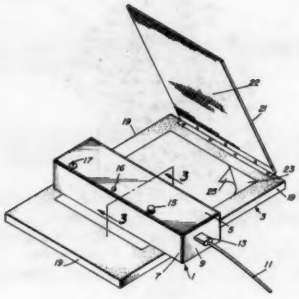
**3,655,970**
**PORTABLE THERMOGRAPHIC DUPLICATOR**
**Warren F. Betzler, P.O. Box 749, Elmira, N.Y.**
**Filed June 22, 1970, Ser. No. 48,050**
**Int. Cl. G01n *21/34***
**U.S. Cl. 250—65 T** **4 Claims**



A portable, manually operable, miniaturized copier operable by being manually rolled across the surface of sensitized paper under which the graphic material to be copied is positioned. An electric heat lamp disposed in the copier and movable therewith, control means for said electric heat lamp, including a safety switch, and rotatable means in said copier and combined with said heat lamp exerting a degree of pressure on the work in the operation of the copier or duplicator.

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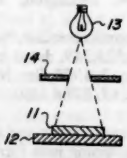
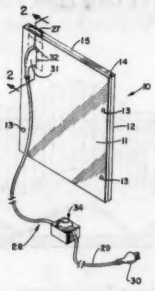
**3,655,971**
**IMAGING SYSTEM**
**Werner E. L. Haas; James E. Adams, both of Webster; James H. Becker, Penfield, and Joseph J. Wysocki, Webster, all of N.Y., assignors to Xerox Corporation, Rochester, N.Y.**
**Filed Aug. 12, 1969, Ser. No. 849,418**
**Int. Cl. H01j *37/22***
**U.S. Cl. 250—65 R** **53 Claims**



A system wherein a film of liquid crystalline material is exposed to ultraviolet radiation thereby producing a visible image.

**3,655,972**
**CASSETTE**
**James H. Somerset, 140 Humbert Avenue, Syracuse, N.Y.**
**Filed Nov. 26, 1969, Ser. No. 880,346**
**Int. Cl. H05g *1/28***
**U.S. Cl. 250—67** **4 Claims**



This invention relates to a cassette for taking and identifying X-ray radiographs comprising means defining an access slot in the cassette, a film identification chamber in a portion of the cassette communicating with said slot, electroluminescent means in said chamber capable of emitting visible light upon electrical excitation, and means to provide electrical connection between the electroluminescent means and means for supplying electrical excitation.

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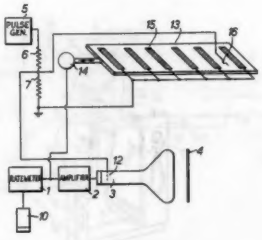
**3,655,973**
**RADIO-ISOTOPE SCANNING MACHINE FOR MORE CLEARLY REPRESENTING CONTOURS OF EQUAL RADIATION INTENSITY**
**Reginald Sear, London, and Peter Mervyn Dean, Ealing, both of England, assignors to National Research Development Corporation, London, England**
**Filed June 18, 1969, Ser. No. 834,468**
**Claims priority, application Great Britain, June 19, 1968, 29,130/68**
**Int. Cl. G01t *1/20***
**U.S. Cl. 250—71.5 S** **6 Claims**



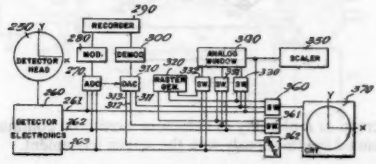

A radio-isotope scanning machine provides a photoscan of a field of interest which contains contour lines representing levels of equal intensity of radiation. Between each contour line the density of the display can vary from zero to a maximum, or alternatively, the photo display can vary from zero to a maximum throughout the full range of measured intensity of radiation and regions of low or zero density can be introduced at predetermined levels.

3,655,974

## ANALOG WINDOW APPARATUS FOR SIGNALLING WHETHER A DATA POINT REPRESENTED BY A PAIR OF COORDINATE SIGNALS IS WITHIN A SELECTABLY SHAPED REGION OF TWO-DIMENSIONAL SPACE

Oreste J. Lucchesi, Schaumburg, Ill., assignor to Nuclear-Chicago Corporation, Des Plaines, Ill.

Filed June 23, 1969, Ser. No. 835,534
Int. Cl. G01t 1/20
U.S. Cl. 250—71.5 S 5 Claims



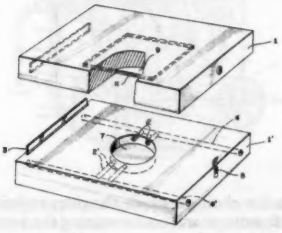

Analog window apparatus for use with Anger-type scintillation camera or the like. Two phase-related sinusoidal waveforms of the same frequency determine an analog window of a shape dependent upon the phase relationship. Two comparison circuits receive coordinate signals and the sinusoidal waveforms and register output indications when the amplitudes of the waveforms exceed the amplitudes of corresponding coordinate signals and a gate and hold circuit registers an output when coincident output indications are received at some instant during a comparison period lasting at least one period of the waveforms.

3,655,975

## FILM BADGE RADIATION DOSIMETER FOR DETECTING RADON

Robley D. Evans, 15 Hickory Lane, Belmont, Mass.

Filed Apr. 4, 1966, Ser. No. 539,691
Int. Cl. G01t 1/08
U.S. Cl. 250—83 16 Claims



The present invention relates to radiation detecting apparatus, being more particularly concerned with portable radiation indicating devices such as radon and radon daughter product film badges and other similar apparatus.

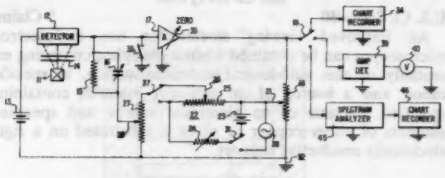
3,655,976

## FREQUENCY STANDARDIZED PENETRATING RADIATION GAUGE

George I. Doering, Columbus, Ohio, assignor to Industrial Nucleonics Corporation

Filed Oct. 11, 1967, Ser. No. 674,434
Int. Cl. G01t 1/16
U.S. Cl. 250—83.3 D 1 Claim

Disclosed are a system for and method of standardizing the frequency response of a plurality of thickness measuring radiation gauges, having resistance capacitance networks connected to the outputs thereof. Each gauge is source and zero standardized by adjusting a potentiometer in the feedback loop of an amplifier and the zero point of the amplifier, respectively. Thereafter, each gauge is frequency stan-



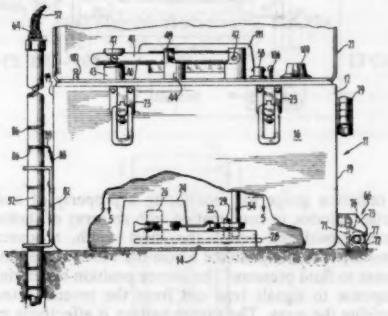

dardized by adjusting the time constant of frequency determining impedances. The determination of the frequency response of each gauge is made by modulating the gauge characteristics and measuring the reduction in amplitude of the gauge output relative to D.C.

3,655,977

## RADIATION EMISSION AND DETECTION APPARATUS FOR DETERMINING DENSITY OF A MATERIAL

Patrick J. Campbell, 124 Brichanan Circle, Pacheco, Calif.

Filed Apr. 2, 1969, Ser. No. 812,619
Int. Cl. G01n 23/06
U.S. Cl. 250—83.6 S 6 Claims



Apparatus is described which is capable of determining characteristics of a volume of material by both measuring (a) the amount of radiation emitted by a radioactive source transmitted a predetermined distance through the material and by measuring (b) the amount of radiation from a source reflected by the material. The apparatus includes an exterior housing having contained therein at a predetermined location adjacent its bottom wall a radiation shielded container for a radioactive source. The container has a radiation transparent opening through which radiation from the radioactive source is emittable in a predetermined direction, and a shutter arrangement is provided for selectively blocking and freeing the opening. A detector of radiation is contained within an end section of an elongated rod which may be releasably secured to the housing at a first location, shielded from the source container opening, at which the detector will detect substantially only radiation which is reflected toward the detector, and at a second location at which the detector depends downwardly below the bottom wall of the housing in direct line-of-sight to the opening for the detection of radiation emitted from the opening and transmitted a predetermined distance through the material located between the opening and the detector.

**3,655,978**

## ZINC CADMIUM SULFIDE CATHODOLUMINESCENT SCREEN

**Sixdeniel Faria, and David J. Harrigan, both of Towanda, Pa., assignors to Sylvania Electric Products Inc.**

**Filed Sept. 4, 1970, Ser. No. 69,843**
**Int. Cl. H01j 1/62**
**U.S. Cl. 250—80** **9 Claims**

An improved viewing screen for use in electron microscopes can be obtained when a phosphor consisting essentially of zinc sulfide and cadmium sulfide, in specific ratios, and a source of an activator material containing specified amounts of an aluminum source and specified amounts of either copper or silver is substrated on a rigid electrically conductive support.

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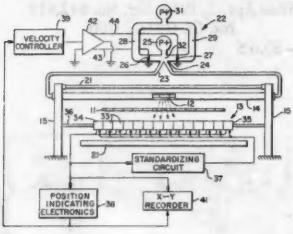
**3,655,979**

## RADIATION GAUGE FOR MONITORING SHEET PROPERTIES EMPLOYING A SCANNED SOURCE

**Ernest D. Jernigan, Jr., Columbus, Ohio, assignor to Industrial Nucleonics Corporation**

**Filed May 10, 1968, Ser. No. 728,195**
**Int. Cl. G01t 1/17**
**U.S. Cl. 250—83.3 D** **36 Claims**




A radiation gauge for monitoring a property of a sheet material includes, in combination with an array of stationary detectors positioned across the sheet width, a source of penetrating radiation scanned across the width of the sheet in response to fluid pressure. The source position is determined in response to signals read out from the several detectors comprising the array. The source pattern is effectively maintained isotropic by a slot and key arrangement or by rotating the source at a relatively high spin velocity. The individual detectors are calibrated for different responses across the sheet width. Source detector standardization is performed by translating the source to an off-sheet position so that the source field impinges on an off-sheet detector. In response to standardizing with the off-sheet detector, each of the other detectors is standardized in a like manner.

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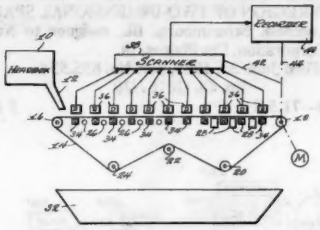
**3,655,980**

## MEASURING WATER DRAINAGE RATE FROM WET STOCK FOURDRINIER SCREEN USING RADIATION SOURCE AND DETECTORS

**David A. Bossen, Los Altos Hills, Calif., assignor to Industrial Nucleonics Corporation**

**Filed June 20, 1968, Ser. No. 738,435**
**Int. Cl. G01t 1/16**
**U.S. Cl. 250—83.3 D** **15 Claims**

In a Fourdrinier papermaking machine, the variation in the mass of the slurry along the length of the Fourdrinier travelling forming screen and the rate of water drainage therethrough are determined by a radioactive wire threaded along the length of the screen, or a plurality of radioactive sources successively disposed therealong, in conjunction with either a single radiation detector moved synchronously with




the screen or a plurality of detectors monitored continuously or scanned synchronously with the screen movement.

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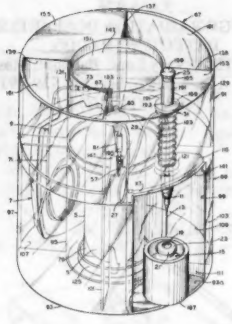
**3,655,981**

## CLOSED SYSTEM GENERATION AND CONTAINERIZATION OF RADIOISOTOPES FOR ELUTING A DAUGHTER RADIOISOTOPE FROM A PARENT RADIOISOTOPE

**James R. Montgomery, Maplewood, and Lloyd G. Struttman, St. Louis, both of Mo., assignors to Mallinckrodt Chemical Works, St. Louis, Mo.**

**Filed Nov. 29, 1968, Ser. No. 779,793**
**Int. Cl. G21h 5/00**
**U.S. Cl. 250—106 T** **31 Claims**

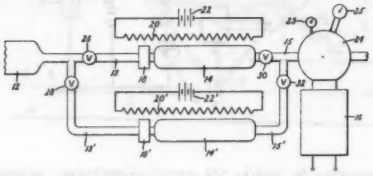


Apparatus for eluting a sterile daughter radioisotope from a parent radioisotope and containerizing the resultant eluate in an evacuated container having a rubber stopper, providing for delivery of a sterile pyrogen-free eluant from a sealed supply through a sterile charge of the parent radioisotope sealed in a shielded generator and thence to a tubular needle adapted to be pierced through the stopper of the evacuated container for suctioning the eluant from the sealed eluant supply into the generator and for suctioning the resultant eluate into the container. The needle is applied to a fitting on a plunger adapted to be pushed down to pierce the needle through the stopper. Eluate is delivered from the generator to the fitting for flow through the needle via an eluate conduit having a flexible tubing portion permitting movement of the plunger and the fitting, with an arrangement whereby the plunger, when retracted, pinches the flexible tubing portion closed, the flexible tubing portion being automatically released when the plunger is driven downward to open the flexible tubing portion for flow therethrough of the eluate under suction induced by the piercing of the needle through the stopper into the evacuated container.

## 3,655,982
## APPARATUS FOR WATER DETECTION USING A RADIOACTIVE TRITIUM LABELLED REACTANT

Vincent L. Gelezunas, Devon, Pa., assignor to General Electric Company

Filed Jan. 29, 1969, Ser. No. 795,111
Int. Cl. G21h 5/02
U.S. Cl. 250—106 T 3 Claims

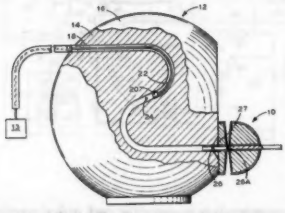


A method and apparatus for detecting water using an appropriate radioactive labelled alkaline earth hydride as a reactant. Fluid from a gas liquid or solid sample to be tested is passed through a bed of the reactant. The water present in the sample reacts with the reactant forming a radioactive product whose radioactivity is then measured to give a quantitative determination of the amount of water in the sample or a qualitative determination of the presence of water.

## 3,655,983
## APPARATUS FOR STORING AND EXPOSING A RADIOACTIVE SOURCE

Gilbert R. Forrer, Barberton, Ohio, assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Mar. 24, 1969, Ser. No. 809,657
Int. Cl. G21f 5/02
U.S. Cl. 250—106 S 10 Claims



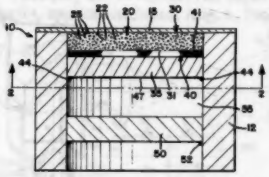
A source exposing head adapted to be mounted on a container of radiation resistant material which has a passageway within which a movable radioactive source is stored. The head is a mass of radiation resistant material providing a shielded extension of the passageway of the storage container and provides an annularly shaped source exposure aperture externally of the storage container.

## 3,655,984
## NON-SHIFTING RADIATION SOURCE CAPSULE

John R. Dukes, Worthington, Ohio, assignor to Industrial Nucleonics Corporation

Filed Dec. 18, 1969, Ser. No. 886,338
Int. Cl. G21h 5/00
U.S. Cl. 250—106 S 9 Claims

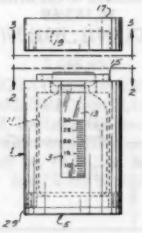
A substantially immobile "non-shifting" relatively low energy radiation source includes a particulate radioisotope bearing material positioned within a chamber formed in a capsule. Movement of the radioactive isotope element or any attenuating mass is prevented by a porous deformable conformational barrier member which has pores therein smaller than the smallest particle adjacent to the barrier and which prevents any attenuating producing movement of any particulate material within the capsule. In the case of gas producing radioisotopes, provision is made to permit escape of gas while preventing movement of attenuating masses or radioactive isotope material. Various radioisotopes and barrier members are described as well as various ways to assemble a "non-shifting" source.



## 3,655,985
## RADIATION-SHIELDING RECEPTACLE FOR A BOTTLE FOR RECEIVING A RADIOACTIVE ELUATE

James L. Brown, St. Louis County; Donald T. Himebaugh, Ballwin, and James R. Montgomery, St. Louis County, all of Mo., assignors to Mallinckrodt Chemical Works, St. Louis, Mo.

Filed May 20, 1969, Ser. No. 826,224
Int. Cl. G21f 5/00
U.S. Cl. 250—108 R 13 Claims



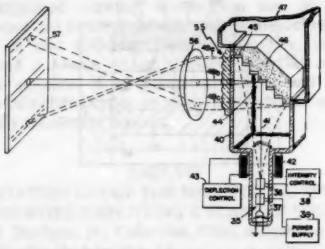
A radiation-shielding receptacle for holding a glass bottle for receiving the eluate from the elution of a radioactive material is disclosed. The receptacle includes a hollow cylindric body of nontransparent radiation-shielding material having a window opening in its wall. A first end closure of radiation-shielding material is provided at one end of the body and a second end closure of radiation-shielding material is provided at the other end of the body. The second end closure has a central opening therein smaller than the internal diameter of the body and of a size so that the mouth of a bottle positioned in the body is exposed to receive the eluate. An insert of substantially transparent radiation-shielding material is secured in and fills the window opening so that the eluate in a bottle in the body may be viewed from the outside. The thickness of the body and the thickness of the insert are sufficient to provide a substantial amount of shielding against radioactive emission from the eluate.

**3,655,986**

## LASER DEVICE

**Benjamin Lax, Newton, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.**

**Filed Oct. 20, 1964, Ser. No. 405,041**
**Int. Cl. H04b** *9/00*
**U.S. Cl. 250—199** **6 Claims**



A moving and/or modulated beam of electromagnetic radiation is produced employing a body of selected semiconductor material with means on one side for launching a beam of high intensity electrons against the material, so as to produce therein a sufficient population of elevated energy states that transitions of the elevated energy states to lower energy states is accompanied by the production of an intense beam of electromagnetic radiation which issues from the semiconductor body.

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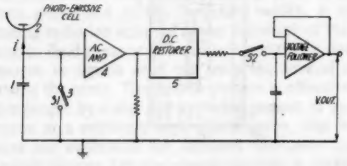
**3,655,987**

## MEANS FOR NOISE REDUCTION IN OUTPUT OF PHOTOEMISSIVE CELL COMPRISING PERIODICALLY DISCHARGED INTEGRATOR CAPACITOR

**David Hinds, York, England, assignor to Vickers Limited, London, England**

**Filed May 26, 1970, Ser. No. 40,581**
**Claims priority, application Great Britain, July 17, 1969, 36,163/69**
**Int. Cl. G01j ; H01j** *39/12*
**U.S. Cl. 250—206** **9 Claims**




An electrical circuit including a photoemissive cell and an integrator capacitor which receives current from the cell and which is repeatedly discharged, the output being amplified to produce an amplified representation of the photocurrent of the cell with reduced noise.

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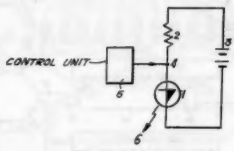
**3,655,988**

## NEGATIVE RESISTANCE LIGHT EMITTING SWITCHING DEVICES

**Tutomu Nakamura, Akashi-shi; Saburo Matsuda, Nara-shi, and Yoichi Ito, Osaka, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Dec. 10, 1969, Ser. No. 883,776**
**Claims priority, application Japan, Dec. 11, 1968, 43/90657**
**Int. Cl. G01j** *5/00;* **H01j** *31/50;* **H03k** *3/42*
**U.S. Cl. 250—209** **10 Claims**

A switching device includes a negative resistance light emitting two-terminal switching semiconductor element connected in series with a load and a direct current power source. Control means control the switching of the light emission of the device and photoelectric converter means ob-




tain an output indicative of the condition of the device. The semiconductor element is a four layer device with the center junction normally reverse biased.

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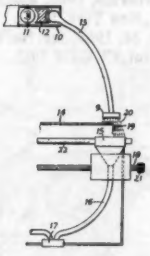
**3,655,989**

## RADIATION SENSITIVE STRIP WIDTH MEASURING UNIT AND SPLIT EDGE DETECTOR

**Robert W. Robinson, Bedford, England, assignor to British Steel Corporation, London, England**

**Filed July 6, 1970, Ser. No. 52,430**
**Int. Cl. G01b** *7/04*
**U.S. Cl. 250—219 WD** **9 Claims**



A strip monitoring apparatus and more particularly to apparatus for continuous precision measuring of the width of a strip and for detecting faults, such as splits in the edge of the strip. The apparatus for monitoring a strip comprises a light source, at least one light guide member for conducting light from said light source to a surface in the area of an edge of a strip of material, a corresponding guide member arranged to receive light from said one guide member and means for recording and interpreting light received from said corresponding guide member.

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**3,655,990**

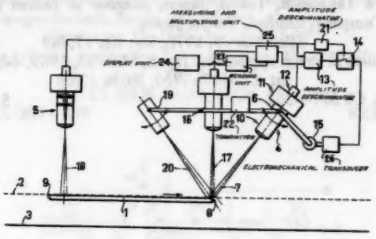
## RADIATION SENSITIVE LENGTH MEASURING SYSTEM

**Karl Gustav Nordqvist, Nynashamn, Sweden, assignor to Rederiaktiebolaget Nordstjernan, Nynashamn, Sweden**

**Filed Oct. 30, 1968, Ser. No. 771,909**
**Claims priority, application Sweden, Nov. 3, 1967, 15083/67**
**Int. Cl. G01b** *7/04*
**U.S. Cl. 250—219 LG** **19 Claims**

An optical measuring system for automatically measuring an object of measurement in a measuring plane by automatically tracking and following the position in a measuring plane

of a contour defining the object of measurement, by utilizing a detectable difference in a self-emitted or reflected elec-



tromagnetic radiation between the object of measurement and a background to the same.

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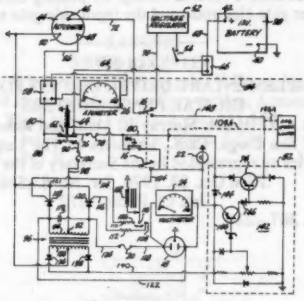
## 3,655,991
## POWER OUTPUT UNIT AND METHOD FOR DELIVERING CONSTANT FREQUENCY, CONSTANT VOLTAGE AC POWER

**Franklin R. Schneider, Seattle, Wash., assignor to Modern Industries, Incorporated, Seattle, Wash.**

**Filed Feb. 8, 1971, Ser. No. 113,332**
**Int. Cl. H02j 3/00**
**U.S. Cl. 307—10 R** **22 Claims**



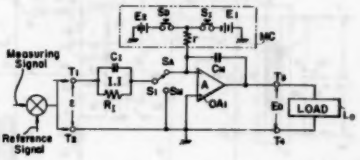
An accessory unit for use with an engine powered vehicle having a conventional electrical system including a battery, voltage regulator and a dynamo which in normal operation supplies DC power to the vehicle electrical system, including switches adapted to isolate the dynamo from the vehicle electrical system, and means for boosting the DC voltage dynamo output and converting it to a constant frequency AC voltage. An outlet receptacle is provided to accept jacks from power tools, appliances or the like having constant frequency AC voltage power requirements. The outlet receptacle voltage is monitored and the dynamo field current is adjusted in response to variations therein to control the dynamo voltage and amperage input to the unit.

In another embodiment of the invention, a secondary coil is provided on the transformer along with conventional rectifying means to step down and rectify the increased AC output voltage. Voltage regulator means is provided to sense variations in this low voltage DC secondary output and control the dynamo field current in response to variations therein to maintain a desired dynamo output voltage and amperage. Additionally, the vehicle battery may be charged by an output from the rectified low voltage secondary output of the transformer.

## 3,655,992
## ELECTRIC CONTROLLER SYSTEMS WITH MANUAL AND AUTOMATIC MODE

**Isamu Ohno, Tokyo; Akio Kobayashi, Tokyo; Akira Ohte, Tokyo; Minoru Tamuki, Kawasaki, and Susmu Ohto, Tokyo, all of Japan, assignors to Yokogawa Electric Works, Ltd., Tokyo, Japan**

**Filed July 27, 1970, Ser. No. 58,477**
**Claims priority, application Japan, Aug. 6, 1969, 62158/69**
**Int. Cl. H01h 31/00**
**U.S. Cl. 307—87** **27 Claims**




In an controller for effecting bumpless switching between the manual control operation and the automatic control operation there are provided an input impedance connected to receive a measured signal from a processing system, an operational amplifier to provide an output signal to a load, a transfer switch connected between the input impedance circuit and the operation amplifier, a feedback capacitor for the operational amplifier to store a voltage related to the output signal, and a manual setter including means to modify the voltage stored in the feedback capacitor by an external signal. During the automatic adjusting operation the transfer switch is operated to connect the input impedance circuit to the input terminal of the operation amplifier whereas during the control operation by the external signal the transfer switch is operated to disconnect the input impedance circuit from the operational amplifier thus modifying the voltage stored in the feedback capacitor by the signal supplied by the manual controller.

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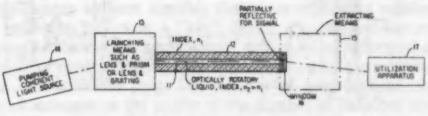
## 3,655,993
## OPTICALLY ROTATORY DIELECTRIC-GUIDED PARAMETRIC OSCILLATORS

**Peter Adalbert Wolff, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.**

**Filed July 10, 1970, Ser. No. 53,839**
**Int. Cl. H03f 7/00**
**U.S. Cl. 307—88.3** **3 Claims**

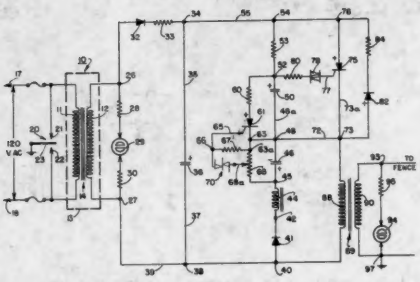

PARTIALLY REFLECTIVE FOR SIGNAL
EXTRACTING MEANS
LAUNCHING MEANS SUCH AS LENS & PRISM OR LENS & GRATING
INDEX, n1
OPTICALLY ROTATORY LIQUID, INDEX, n2 < n1
UTILIZATION APPARATUS

There is disclosed a parametric oscillator having reduced optical loss and increased interaction pathlength because it employs an optically rotatory liquid in a capillary tube of lower refractive index and of internal diameter of the order of one micrometer. The pumping beam is launched off-axis into the liquid to generate signal and idler beams such that all three beams at any given point propagate in intersecting directions and yet are guided along the capillary tube. Each beam is reflected at the capillary wall with at least a minimum angle $\Phi$ from the normal to the glass, such that $\sin \Phi$ is greater than the ratio of the index of refraction of the glass to the index of refraction of the liquid.

## 3,655,994
## ELECTRIC FENCE CHARGER

Elmer K. Malme, St. Charles, Ill., assignor to Wire Sales Company, Chicago, Ill.

Filed Feb. 8, 1971, Ser. No. 113,477
Int. Cl. H01h 47/00
U.S. Cl. 307—132 R 8 Claims

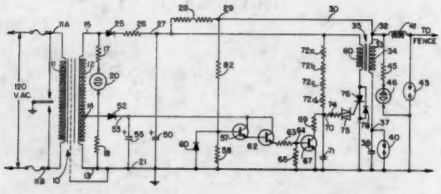



A device for periodically applying a high potential on an electric fence has means for applying such potential for very short times at periodic intervals. The time between successive charging intervals depends upon whether the fence is "loaded" (where an animal grounds such fence) or is "unloaded". If the fence is "unloaded", the repetition rate of charging pulses is minimized and if the fence is "loaded", the pulse repetition rate is increased. The change in pulse repetition rate is determined by the fence "loading" reflected into the fence charger system and determines the discharge level of a timing capacitor.

## 3,655,995
## AUTOMATIC ELECTRIC FENCE CHARGING SYSTEM

Elmer K. Malme, St. Charles, Ill., assignor to Wire Sales Company, Chicago, Ill.

Filed Feb. 8, 1971, Ser. No. 113,480
Int. Cl. H01h 47/00
U.S. Cl. 307—132 R 3 Claims

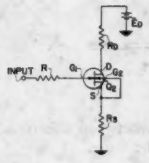



A fence charging system includes a sensing circuit connected to a fence to be charged. The sensing circuit applies a harmless low voltage which normally maintains a fence charger below operating level so long as the fence is "unloaded" (has a high resistance in the absence of at least one animal grounding the fence). When the fence becomes "loaded," the current drawn by the fence sensing system changes potential distribution in the fence charging system and permits the charger to operate normally, the fence charging system under such conditions impressing high voltage pulses on the fence at predetermined intervals so long as the fence remains "loaded."

## 3,655,996
## PROTECTIVE CIRCUIT FOR INPUT CIRCUIT OF JUNCTION TYPE FIELD EFFECT TRANSISTOR

Toru Takahashi, Tokyo, Japan, assignor to Iwatsu Electric Company, Limited, Tokyo, Japan

Filed Mar. 9, 1970, Ser. No. 17,489
Claims priority, application Japan, Mar. 13, 1969, 44/19004
Int. Cl. H02h 7/20; H03k 17/60
U.S. Cl. 307—202 5 Claims

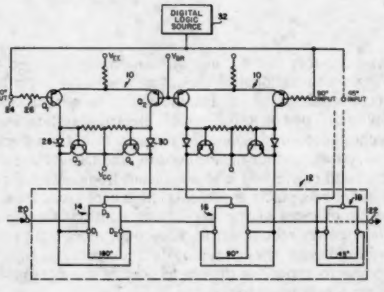



In a protective circuit for input circuit of a junction type field effect transistor, a plurality of gate electrodes are provided for the transistor, an input protective resistor is connected between a signal input terminal and an input side gate electrode and the other gate electrode is connected to the source electrode of the field effect transistor. The protective resistor functions to protect the field effect transistor against excessive forward voltage by passing current between the input side gate electrode and the source electrode and against excessive reverse voltage by passing current between the other gate electrode and the input side gate electrode.

## 3,655,997
## COMPLEMENTARY DRIVER CIRCUIT FOR DIODE DIGITAL PHASE SHIFTERS

Stephen A. O'Daniel; Murray H. Mott, and Robert W. Jones, all of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Oct. 23, 1970, Ser. No. 83,556
Int. Cl. H03k 19/12
U.S. Cl. 307—210 1 Claim

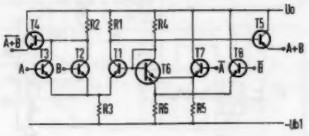



A solid state complementary circuit for driving PIN diode digital phase shifters wherein PIN diodes are used to digitally switch in or switch out phase increments or bits. The driver circuit essentially comprises an emitter-coupled PNP transistor pair for each phase bit of the phase sifter. The transistor pairs are operable in response to digital logic control signals to provide complementary outputs which in one state switch in a selectively predetermined phase bit and in the opposite state switch out the phase bit.

## 3,655,998
## LOGICAL GATE SWITCHING CIRCUIT IN ECL-SWITCHING CIRCUIT TECHNIQUE

Wilhelm Wilhelm, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Aug. 21, 1970, Ser. No. 65,777
Claims priority, application Germany, Aug. 25, 1969, P 19 43 205.4
Int. Cl. H03k *19/34, 19/36, 19/22*
U.S. Cl. 307—215 8 Claims

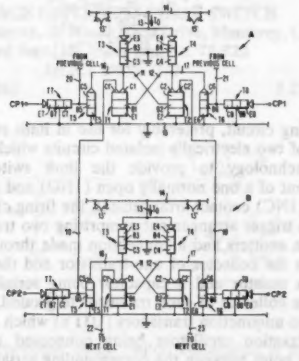


A logical gate switching circuit in ECL-switching circuit technique, which is designed as a push-pull circuit for the logical linkage of input signals in both their normal form and their inverted form, preferably having a differential amplifier cooperable therewith employing two emitter-coupled transistors and including a multi-emitter transistor, respective emitters of which are operatively controlled by the input signals in their inverted form.

## 3,655,999
## SHIFT REGISTER

Siegfried K. Wiedmann, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 5, 1971, Ser. No. 131,154
Int. Cl. G11c *19/00;* H03k *3/286*
U.S. Cl. 307—221 R 10 Claims

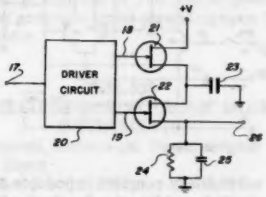


A shift register comprises a series of half-cells with means to transfer the information stored in each half-cell to the next half-cell in the series upon the application of a clock-pulse signal. The circuit is made with just two diffusion steps, obviating the need for an isolation diffusion or a subcollector diffusion.

## 3,656,000
## FREQUENCY TO VOLTAGE CONVERTER WITH IMPROVED TEMPERATURE STABILITY

John L. Neathery, Jr., Austin, Tex., assignor to Nuclear-Chicago Corporation, Des Plaines, Ill.

Filed Apr. 1, 1969, Ser. No. 812,196
Int. Cl. H03k *5/20*
U.S. Cl. 307—233 3 Claims

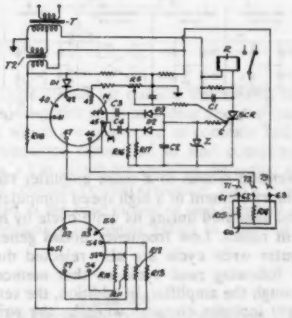



A count rate circuit employing a pair of field effect transistors in the charging and discharging paths of a capacitor to provide temperature stable operation.

## 3,656,001
## SECURITY DEVICES

Benno Bensiyon Saul, 5830 St. Luc, Apt. 16, Montreal, Quebec, Canada

Filed June 10, 1970, Ser. No. 45,064
Int. Cl. H03k *5/00;* G08b *21/00*
U.S. Cl. 307—235 1 Claim



Relay contacts are controlled by obtaining zero output simultaneously from two or more balanced circuits. Such simultaneous balance signifies that a corresponding number of resistance values in a "key" device complement the resistance values in a "combination" device which is formed as a plug for ready changing of the combination by the substitution of a different plug. The number of combinations obtained increases as the power of the number of balanced circuits. The relay contacts can be used to control a lock, burglar alarm or other security device.

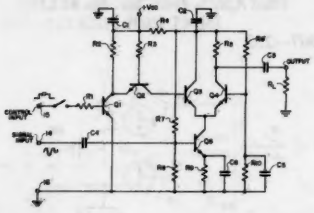
## 3,656,002
## SWITCHING CIRCUIT

Russell A. Gilson, Oakhurst; William F. Kiss, West Allenhurst, and Vincent J. Organic, Neptune, all of N.J., assignors to The United States of America as represented by the Secretary of the Army

Filed Nov. 24, 1970, Ser. No. 92,487
Int. Cl. H03k *17/60*
U.S. Cl. 307—235 12 Claims

A switching circuit for providing maximum isolation between a radio frequency source and a load when the cir-

cuit is in a first operating condition and for delivering substantially maximum energy from said source to said load when the circuit is in a second operating condition, while



presenting a substantially constant impedance to the source during both operating conditions, whereby the load is always matched to the source.

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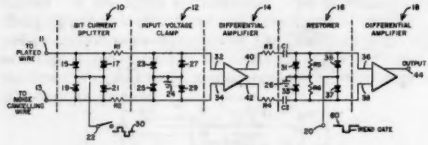
**3,656,003**

**SENSE AMPLIFIER FOR COMPUTER MEMORY OPERATING UNDER HIGH SPEED CYCLE TIMES**

**Chung-Ho Chen, Plymouth Meeting, Pa., and Roy D. Thomas, Wenonah, N.J., assignors to Sperry Rand Corporation, New York, N.Y.**

**Filed July 10, 1970, Ser. No. 53,743**
**Int. Cl. H03k** *5/20, 5/08*
**U.S. Cl. 307—238** **10 Claims**



This invention relates to a sense amplifier circuit for use with a memory element of a high speed computer which does not become saturated during its write cycle by high frequency transient noises. Low frequency noises generated during the computer write cycle are also rejected during an immediately following read cycle so that memory output is passed through the amplifier. In addition, the sense amplifier arrangement includes circuitry whereby the write (i.e., bit) current driving voltage for recording information into the memory is substantially reduced.

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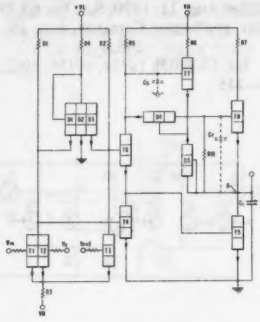
**3,656,004**

**BIPOLAR CAPACITOR DRIVER**

**Douglas W. Kemerer, Beacon, and Jeboshua N. Pomeranz, Monsey, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Sept. 28, 1970, Ser. No. 75,994**
**Int. Cl. H03k** *17/00*
**U.S. Cl. 307—246** **8 Claims**

This specification discloses a bipolar driver which will charge a capacitive load to substantially the potential supplied to the driver. The driver includes two transistors that couple the load to a source of potential. One transistor is connected in shunt with the load while the other transistor is connected in series with the load and the source of potential. The shunt-connected transistor is used to discharge the capacitive load while the serially connected transistor is used to charge the capacitive load with charge from the source of potential. To allow the capacitive load to be charged to the full potential of the source, the driver includes circuitry which decouples the base of the serially connected transistor from the source of potential and drives the transistor with charge accumulated in the base-to-emitter junction of the transistor so that the serially connected transistor will not be



turned off until the potential across the capacitive load reaches the potential of the driving source.

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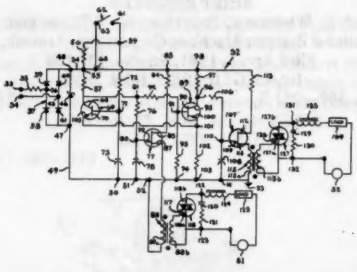
**3,656,005**

**TWO CIRCUIT SOLID STATE LIMIT SWITCH (1NO AND 1NC)**

**Art Lee, El Paso, Tex., assignor to General Electric Company**

**Filed July 15, 1970, Ser. No. 55,052**
**Int. Cl. H03k** *3/295, 17/28;* **H01h** *1/66*
**U.S. Cl. 307—247 A** **20 Claims**

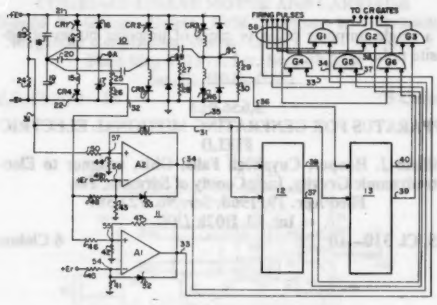


A firing circuit, preferably for use in limit switches, consisting of two electrically isolated circuits which utilize solid state technology to provide the limit switch with the equivalent of a one normally open (1NO) and one normally closed (1NC) contact arrangement, the firing circuit consisting of a trigger arrangement comprising two transistors with common emitters and a connection made through a resistor between the collector of one transistor and the base of the other, a resistor and a capacitor being serially connected from the collector of each transistor to ground, the emitters from two unijunction transistors (UJT's) which form parts of two relaxation oscillators being connected to the intermediate point between the corresponding serially connected resistor and capacitor, the bases of the UJT's being connected to the primary windings of two pulse transformers thus providing two electrically isolated outputs for the firing of two isolated Triac circuits connected to the secondary windings of the pulse transformers, the trigger arrangement and the relaxation oscillators being connected across the output of a Zener regulated diode bridge rectifier to which an input voltage is applied, and an actuating switch being provided to control application of voltage to the base of one of the transistors to thereby control its conduction.

## 3,656,006
## TOLERABLE VOLTAGE CONTROL CIRCUIT

Robert F. Bourke, Oconomowoc, and Jon W. Simons, Cudahy, both of Wis., assignors to The Louis Allis Company

Filed Jan. 16, 1970, Ser. No. 3,368
Int. Cl. H03k 17/00
U.S. Cl. 307—252 M 4 Claims

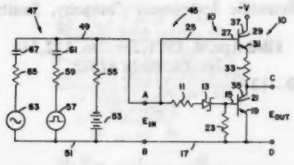


With capacitive commutation, the controlled rectifiers of an inverter can be subjected to large voltages at the time of firing. To inhibit firing until the voltage across each controlled rectifier has decreased to safe levels, the present invention employs a switchable amplifier for each controlled rectifier which is responsive to the voltage across the controlled rectifier. The amplifier has two thresholds for switching from a firing-inhibit state to a permit-to-fire state. One threshold, established by a reference voltage and resistor divider, is set to the maximum tolerable voltage for the controlled rectifier. The second threshold permits lower level firing and because it is established by the positive amplifier feedback, this threshold is removed when the amplifier switches. Thus, the amplifier contains switching hysteresis enabling firing of the controlled rectifier at a low voltage, but insuring that if the voltage across the controlled rectifier rises above the low threshold it can still be fired within the maximum tolerable level.

## 3,656,007
## VOLTAGE DEPENDENT PHASE SWITCH

Raymond P. Murray, 28 Sierra Vista Drive, Monterey, Calif.

Filed Sept. 25, 1970, Ser. No. 75,522
Int. Cl. H03k 1/12
U.S. Cl. 307—262 5 Claims

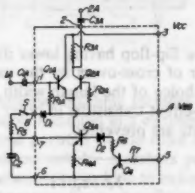


A voltage dependent phase switch comprising a pair of transistors and a zener diode. An input signal is connected in series through the zener diode to drive the base of one of the transistors. The input signal is also connected to the base drive of an emitter follower transistor. When the input signal is negative and less in magnitude than the breakdown voltage of the zener diode then the emitter follower transistor is driven and an output signal is provided therefrom that increases linearly with increase in the input signal. However, when the input signal is negative and greater in magnitude than zener diode breakdown voltage then the transistor that is connected to the zener diode is driven and the voltage output decreases linearly with the increasing negative input voltage thereby providing a voltage dependent phase switch. In another embodiment of the invention an input signal circuit is provided which includes a DC source, a pulse generator and a sinusoidal signal generator wherein the currents are additive and provide a switching function in conjunction with the voltage dependent phase switch where the output sinusoidal signal is in-phase or 180° out of phase with the sinusoidal signal generator signal depending upon the state of the pulse generator.

## 3,656,008
## GATE CIRCUIT FOR ELECTRONIC MUSICAL INSTRUMENTS

Yoshiyuki Nakagomi, Kodaira-shi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 26, 1970, Ser. No. 5,851
Claims priority, application Japan, Feb. 5, 1969, 44/8148
Int. Cl. G10h 5/12
U.S. Cl. 307—268 6 Claims

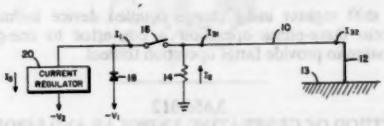


A sustaining gate circuit for musical instruments comprising a differential amplifier stage including a pair of transistors the emitters of which are connected in common and a constant current transistor connected to said commonly connected emitters, a key switch for applying the gating signal to the base of said constant current transistor, and a time-delay circuit connected in the base circuit of said constant current transistor for obtaining sustaining effect in fade-out of the output.

## 3,656,009
## NON-LINEAR TRANSMISSION LINE CURRENT DRIVER

Chung-Ho Chen, Plymouth Meeting, Pa., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Sept. 4, 1970, Ser. No. 69,836
Int. Cl. H03k 5/00
U.S. Cl. 307—268 10 Claims

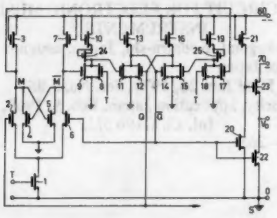



There is disclosed herein an arrangement for developing a fast rise time current pulse in a transmission line. The pulse is produced in the line in steps until the final value of current is reached. By developing the drive current in incremental steps undesirable overshoot is eliminated.

## 3,656,010
## TRANSISTORIZED MASTER SLAVE FLIP-FLOP CIRCUIT

**Bernardus Johannes Maria Huyben, Hertogenbosch; Evert Jan van Barneveld, and Louwrens Marinus Van de Steen, both of Nijmegen, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Dec. 9, 1969, Ser. No. 883,419**
**Claims priority, application Netherlands, Dec. 10, 1968, 6817658; Oct. 3, 1969, 6914950**
**Int. Cl. H03k *5/00, 3/26***
**U.S. Cl. 307—279** **7 Claims**

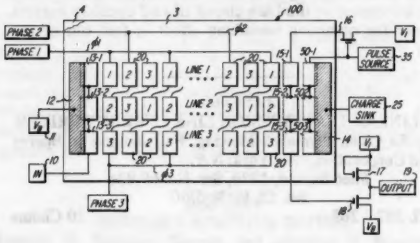


A master slave flip-flop having lower dissipation and for a reduced number of cross-overs by the use of inverse logic, with a correct choice of the length width ratios of the channels of the field-effect transistors in order to prevent untimely changes of state are prevented.

## 3,656,011
## CHARGE COUPLED DEVICE

**Zeev Abraham Weinberg, Princeton, N.J., assignor to RCA Corporation**

**Filed Feb. 2, 1971, Ser. No. 111,876**
**Int. Cl. H01l *11/14***
**U.S. Cl. 307—304** **8 Claims**



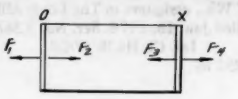

A shift register using charge coupled device techniques wherein three-phase operation is converted to one-phase operation to provide faster operation thereof.

## 3,656,012
## METHOD OF GENERATING UNIPOLAR AND BIPOLAR PULSES

**Norman E. Dixon, Pasco, Wash., assignor to The United States of America as represented by the United States Atomic Energy Commission**

**Filed Feb. 2, 1971, Ser. No. 111,957**
**Int. Cl. H01v *7/00***
**U.S. Cl. 310—8.1** **9 Claims**

The method for generating bipolar and unipolar mechanical pulses is described. The unipolar pulses can be in a form

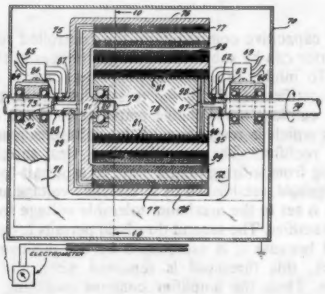



of a single unipolar pulse or pairs of unipolar pulses of opposite polarity.

## 3,656,013
## APPARATUS FOR GENERATING MOTIONAL ELECTRIC FIELD

**William J. Hooper, Cuyahoga Falls, Ohio, assignor to Electrodynamic Gravity, Inc., County of Sarasota, Fla.**

**Filed Apr. 19, 1968, Ser. No. 722,587**
**Int. Cl. H02k *1/00***
**U.S. Cl. 310—10** **6 Claims**

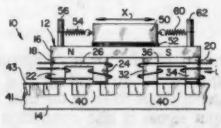


Apparatus for producing and demonstrating properties of motional electric fields by means of rotating magnetic flux produced by a plurality of magnets extending parallel with the axis of rotation, said flux of these magnets being put into rotation about a common axis by mechanical or by electro magnetic means.

## 3,656,014
## DAMPING APPARATUS FOR A LINEAR STEP MOTOR HAVING TWO TRANSLATIONAL DEGREES OF FREEDOM

**Leonard G. Rich, West Hartford, Conn., assignor to The Gerber Scientific Instrument Company, South Windsor, Conn.**

**Filed Apr. 8, 1971, Ser. No. 132,344**
**Int. Cl. H02k *41/02***
**U.S. Cl. 310—13** **6 Claims**



A viscoelastic damping apparatus is mounted to a structure which is moved by at least two linear step motor armatures in a step-by-step manner simultaneously or sequentially in each of two coordinate directions. The step motor armatures each include electromagnetic motor poles which are excited in a

phased sequence to produce movements of the structure in the two coordinate directions. The damping apparatus is composed of inertial mass and a viscoelastic member which connects the mass to the structure to resiliently damp the stepping movements of the structure.

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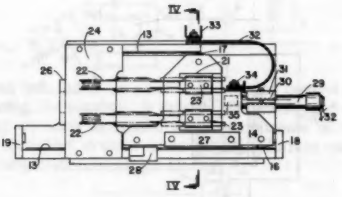
**3,656,015**

## COMBINED LINEAR MOTOR AND CARRIAGE

**Donald E. Gillum, Goleta, Calif., assignor to Information Magnetics Corporation, Goleta, Calif.**

**Filed May 4, 1971, Ser. No. 140,032**
**Int. Cl. H02k** *41/02*
**U.S. Cl. 310—13** **5 Claims**



A linear electric motor has a carriage mounted on the side of the motor for motion parallel to the armature axis and the side of the motor is slotted to accommodate a mechanical connection so that the carriage supports the armature. Torque on the carriage is minimized by axially slicing away an axially parallel part of the normally round motor to locate the carriage ways as close to the motor armature axis as is commercially practicable. The load and the servo feedback transducers are mounted on the carriage at the node point of deflection of the carriage caused by armature torque.

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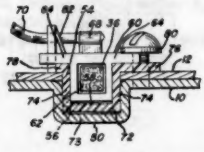
**3,656,016**

## SUBFRAME FOR POWER TOOL HAVING DOUBLE INSULATED BRUSH HOLDERS

**Anthony Jacyno, Aurora, and Harold R. Botefuhr, Bensenville, both of Ill., assignors to G. W. Murphy Industries Inc., Portable Electric Tools Division, Houston, Tex.**

**Filed Oct. 6, 1970, Ser. No. 78,431**
**Int. Cl. H02k** *5/14*
**U.S. Cl. 310—50** **6 Claims**



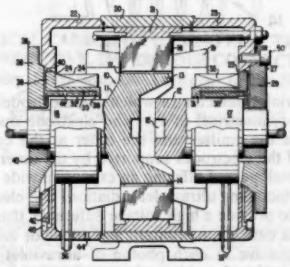
A subframe for a power tool comprised of first and second frame members secured together in contiguous engagement throughout a substantial portion of their peripheries. The frame members include complementary cut outs defining a motor receiving opening. A pair of brush receiving spaces are defined by a pair of stuck out portions on opposite sides of the motor receiving opening in one of the frame members together with an opposed notch in the other of the frame members. Each of the brush receiving spaces is adapted to receive one or more insulating inserts for holding brushes.

**3,656,017**

## ELECTRIC SYNCHRONOUS MACHINE HAVING A COMB-SHAPED POLE TYPE ROTOR

**Junpei Inagaki, and Hitoshi Marumo, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan**

**Filed Sept. 1, 1970, Ser. No. 68,730**
**Claims priority, application Japan, Sept. 1, 1969, 44/68952**
**Int. Cl. H02k** *5/16*
**U.S. Cl. 310—90** **6 Claims**



An electric synchronous machine includes a comb-shaped rotor which is rotatably mounted in a centered bore of a stator. The opposite end portions of the rotor respectively extend through cylindrical tubular members provided on end brackets of the synchronous machine to maintain a small annular air gap therebetween. Exciting coils are wound around the cylindrical tubular members to effect a D.C. excitation of the comb-shaped pole members of the rotor. The magnetic fluxes generated by the exciting coils are passed through the annular air gap to the rotor. The cylindrical tubular members also include fluid paths therein through which a pressurized fluid is ejected into the annular air gap to thereby float the rotor above the inner surface of the cylindrical tubular members during the rotation of the synchronous machine.

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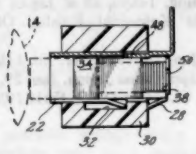
**3,656,018**

## BRUSH HOLDER ASSEMBLY

**William M. Maher, Churchville, N.Y., assignor to General Electric Company**

**Filed Nov. 25, 1970, Ser. No. 92,586**
**Int. Cl. H01r** *39/38*
**U.S. Cl. 310—242** **10 Claims**

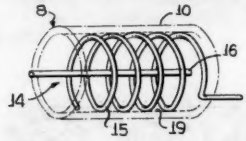


The invention disclosed is a brush holder assembly for use in electric motors. It may be of any general shape and is characterized by suitable structure that provides an interference fit between the brush and its holder whereby the spring-biased brush is wedged in the holder as a preassembly and is then easily released by a slight pressure to permit the brush to smoothly reciprocate in the brush holder against the commutator.

## 3,656,019
## HYDROGEN-FILLED GAS DETECTOR HAVING CATHODE HELIX SUPPORTED BY ENVELOPE WALL

Richard W. Stowe, Falls Church, Va., assignor to Melpar, Inc., Falls Church, Va.

Filed Aug. 11, 1967, Ser. No. 660,046
Int. Cl. H01j *17/06, 17/20, 39/28*
U.S. Cl. 313—217 1 Claim

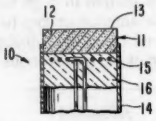



An ultraviolet detector in which the electrode configuration is non-symmetrical in that one electrode operates permanently as the emitter and the other as the collector, at least one of the electrodes supported by the inner surface of the tube envelope and offering an expansive wide angle field of view for incoming ultraviolet radiation. The electrodes are DC biased to provide a high voltage difference therebetween, i.e., between cathode, or emitter, and anode or collector, the former responsive to each photon of ultraviolet energy incident from within the wide angle.

## 3,656,020
## THERMIONIC CATHODE COMPRISING MIXTURE OF BARIUM OXIDE, CALCIUM OXIDE AND LITHIUM OXIDE

Leo J. Cronin, Watsonville, Calif., assignor to Spectra-Mat, Inc., Watsonville, Calif.

Filed Nov. 18, 1970, Ser. No. 90,764
Int. Cl. H01j *1/14*
U.S. Cl. 313—346 DC 7 Claims

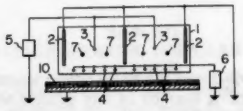



A cathode is disclosed utilizing an emission material of barium oxide, calcium oxide and lithium oxide.

## 3,656,021
## CORONA DISCHARGE DEVICE

Masayoshi Furuichi, Tokyo; Seiichi Miyakawa, Chiba, and Nobuchika Masuda, Tokyo, all of Japan, assignors to Katsuragawa Denki Kabushiki Kaisha, Ota-ku, Tokyo-to, Japan

Filed Jan. 28, 1971, Ser. No. 110,697
Claims priority, application Japan, Jan. 29, 1970, 45/7856
Int. Cl. G03g *15/02*; H01t *19/00*
U.S. Cl. 317—4 7 Claims

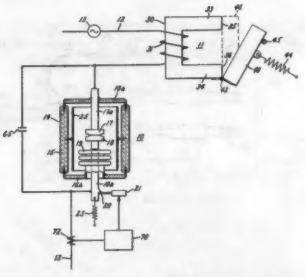



In a corona discharge device wherein corona discharge is established between a fine corona discharge electrode and a counter electrode, a vibration suppression member is positioned between the corona discharge electrode and the counter electrode for preventing transverse vibration of the corona discharge electrode by electrostatic force.

## 3,656,022
## ALTERNATING CURRENT CIRCUIT BREAKER COMPRISING A SERIES REACTOR FOR SHAPING CURRENT AND VOLTAGE WAVES NEAR CURRENT ZERO

Allan N. Greenwood, Media, Pa., assignor to General Electric Company

Filed Mar. 30, 1971, Ser. No. 129,391
Int. Cl. H02h *7/22, 3/08*
U.S. Cl. 317—11 C 5 Claims

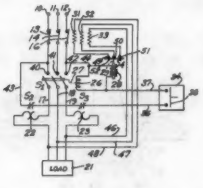


Discloses an a-c circuit breaker comprising the series combination of a reactor and a circuit interrupter that opens in response to overcurrents. The reactor saturates during a severe overcurrent and then comes out of saturation just prior to current zero to force the arcing current to decay at a much lower rate during this latter period than during the immediately preceding period. The reactor is prevented from saturating during normal currents by an air gap in its core which is bridged in response to an overcurrent by a magnetizable armature.

## 3,656,023
## PROTECTIVE CIRCUIT

Joseph M. Hadfield, 5725 North Melvin Avenue, Chicago, Ill.

Filed Sept. 21, 1970, Ser. No. 73,718
Int. Cl. H02h *7/085*
U.S. Cl. 317—13 R 6 Claims



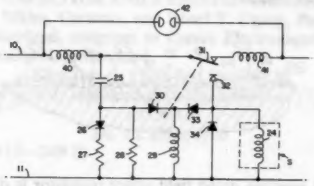
A protective circuit for a load such as an unattended electric motor which operates in response to a control circuit. A heater control circuit is controlled by the control circuit such that power is not applied to the heaters when the control circuit demands that the load be energized. In the event that the main power contacts weld or stick and do not release when the control turns off, contacts to the heaters are closed so that the heaters open bimetallic heat responsive switches in the main power lines.

A modification of the invention is provided for loads of very high power requirements and include large oil switches or air break circuit breakers which are energized if the main power contacts fail to open.

## 3,656,024
## TRANSIENT PROTECTION FOR ELECTRICAL IRRIGATION CONTROL SYSTEMS

Wayne Edward Davis, Bricktown, N.J., assignor to Johns-Manville Irrigation Corporation, New York, N.Y.

Filed Mar. 19, 1971, Ser. No. 126,220
Int. Cl. H02h 9/04
U.S. Cl. 317—20 7 Claims

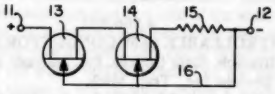


Current induced in an electrical irrigation control system by lightning, for example, is delayed and discharged around the relay contacts and solid state components of the individual sprinkler control units by high current capacity, quick-acting bi-directional gas diodes.

## 3,656,025
## CURRENT LIMITER

Denes Roveti, 15 Lincoln Park Center, Annapolis, Md.

Filed May 4, 1971, Ser. No. 140,048
Int. Cl. H03k 5/08
U.S. Cl. 317—20 10 Claims

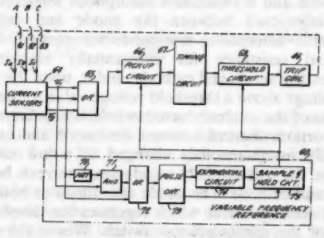


This invention relates to current limiters particularly for medical equipment. The current limiter of this invention is adapted to be inserted directly into the line which connects a patient to an electronic device. It comprises a pair of field effect transistors connected in series with a biasing resistor. One of the transistors has a lower cut-off potential than the other, and the one with the higher cut-off point also has substantially higher resistance and breakdown strength.

## 3,656,026
## SOLID STATE OVERCURRENT DEVICE WITH VARIABLE FREQUENCY REFERENCE

Stanley E. Zocholl, Holland, Pa., assignor to I-T-E Imperial Corporation, Philadelphia, Pa.

Filed Mar. 12, 1971, Ser. No. 123,771
Int. Cl. H02h 3/08
U.S. Cl. 317—36 TD 9 Claims

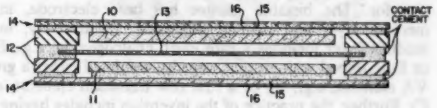


A solid state overcurrent relay is operated from saturating current transformers which generate output voltages which are responsive to the current in a system being monitored. A pickup circuit is operated when the monitored current exceeds a given value and initiates a timing operation by charging an RC circuit. As the voltage of the RC circuit reaches a given value as compared to a reference voltage circuit, a semiconductor switch is operated, thereby to initiate a control operation. Both the pickup level and the output voltage of the timing circuit are compared to reference voltages. The reference voltage is varied in accordance with the frequency of the output sensors so that pickup and timing become relatively independent of frequency variations in the circuit being monitored.

## 3,656,027
## ELECTRICAL CAPACITOR HAVING ELECTRICALLY-CONDUCTIVE, IMPERVIOUS CONNECTOR

Ralph E. Isley, Northfield, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Filed Dec. 28, 1970, Ser. No. 101,912
Int. Cl. H01g 9/00
U.S. Cl. 317—230 10 Claims

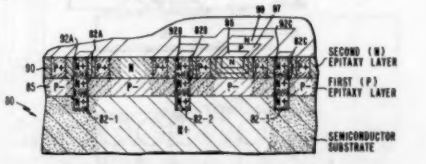



An inter-cell, electron-conducting, ion-insulating connector for use in an electrical capacitor comprising a substrate of metal sheet or graphite which is laminated on at least one side with an elastomer containing electrically conductive carbon black in sufficient amounts to render the elastomer conducting.

## 3,656,028
## CONSTRUCTION OF MONOLITHIC CHIP AND METHOD OF DISTRIBUTING POWER THEREIN FOR INDIVIDUAL ELECTRONIC DEVICES CONSTRUCTED THEREON

Jack L. Langdon, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 12, 1969, Ser. No. 823,662
Int. Cl. H01l 19/00
U.S. Cl. 317—235 R 7 Claims



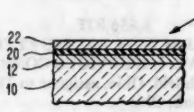

To eliminate parasitic voltage drops to electrodes of semiconductor devices built on a semiconductor chip or wafer, due to the use of an element of a voltage and current supply conductor in common for several such semiconductor devices, a separate path is diffused for each electrode, onto such chip or wafer as a built-up post of the basic semiconductor material of the chip or wafer, and the back surface of the chip or wafer is used as a relatively wide area surface as a voltage supply bus, which may also be connected to a metal base for the double purpose of establishing that surface at some selected known potential and providing a good heat sink for the chip or wafer. Generally, the potential of the metal base may be placed at ground, but need not be.

3,656,029

## BISTABLE RESISTOR OF EUROPIUM OXIDE, EUROPIUM SULFIDE, OR EUROPIUM SELENIUM DOPED WITH THREE D TRANSITION OR VA ELEMENT

Kie Y. Ahn, Bedford, and Kyu C. Park, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1970, Ser. No. 103,224
Int. Cl. H01l 3/16, 3/22
U.S. Cl. 317—234 R 15 Claims




This disclosure provides a bistable resistor and materials therefor. The bistable resistor has base electrode, intermediate layer and counter electrode. Illustratively, intermediate layer includes a rare earth chalcogenide, e.g., EuO or EuS, doped with a percentage by weight of either a group VA element, e.g., Bi, or a first row transition element, e.g., Cr. Further, the practice of the invention includes having the host intermediate layer comprised of a combination of a plurality of different rare earth chalcogenides, and having a dopant configuration which includes a combination of a plurality of the individually suitable dopants.

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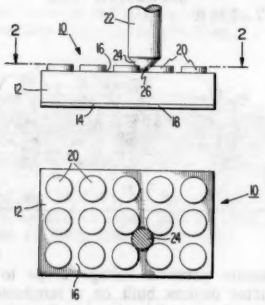
3,656,030

## SEMICONDUCTOR DEVICE WITH PLURALITY OF SMALL AREA CONTACTS

Louis Sebastian Napoli, Hamilton, and John Joseph Hughes, Spotswood, both of N.J., assignors to RCA Corporation

Filed Sept. 11, 1970, Ser. No. 71,599
Int. Cl. H01l 3/00, 5/00
U.S. Cl. 317—234 R 6 Claims



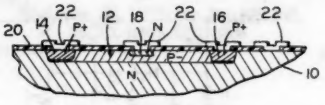

A semiconductor body has an array of small metal film pads thereon. The pads are of uniform size and shape and are arranged with adjacent pads being uniformly spaced from each other. A metal terminal wire has a rounded end which fits between and contacts a plurality of the pads but is spaced from the surface of the semiconductor body so that the electrical connection between the terminal wire and the semiconductor body is through the pads.

3,656,031

## LOW NOISE FIELD EFFECT TRANSISTOR WITH CHANNEL HAVING SUBSURFACE PORTION OF HIGH CONDUCTIVITY

Heber J. Bresee, San Jose, Calif., and James L. Bowman, Portland, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Dec. 14, 1970, Ser. No. 97,730
Int. Cl. H01l 11/14
U.S. Cl. 317—235 10 Claims




A PN junction gated field effect transistor is described in which the channel region is provided with a subsurface portion of higher conductivity than the outer surface of such channel at an intermediate position between the outer surface and the bottom of the channel in order to reduce the noise caused by surface recombination of current carriers and other surface effects, to about one-tenth its previous noise level. This subsurface portion of high conductivity is preferably formed by providing an oxide layer which, during diffusion of the channel, gathers the doping impurity from the surface of the channel to reduce the conductivity of such surface. A further method is to diffuse compensating impurities into the channel which invert the channel surface to an intrinsic material while leaving a subsurface portion of high conductivity.

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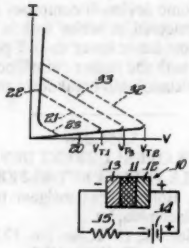
3,656,032

## CONTROLLABLE SEMICONDUCTOR SWITCH

Heinz K. Henisch, State College, Pa., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Filed Sept. 22, 1969, Ser. No. 859,630
Int. Cl. H01l 15/00, 15/02, 15/06
U.S. Cl. 317—235 R 17 Claims




A controllable semiconductor switch comprises an anode, a cathode and a switchable amorphous semiconductor element interposed between the anode and cathode. The switchable amorphous semiconductor element has a high electrical resistance for substantially blocking current between the anode and cathode, and it, upon the application of a voltage above a threshold voltage value to the anode and cathode of the semiconductor switch, is capable of having at least portions thereof between the anode and cathode substantially instantaneously changed to a low electrical resistance for substantially conducting current between the anode and cathode. The anode or cathode or both may comprise a semiconductor which regulates the threshold voltage value of the semiconductor switch. Where the cathode or anode comprises a semiconductor and the other a metal, the semiconductor switch may be asymmetric in its operation, it having a higher threshold voltage value for one polarity of

the voltage applied to the anode or cathode than for the opposite polarity. By controlling the semiconductor anode and/or cathode the threshold voltage value of the semiconductor switch may be varied or regulated to desired values.

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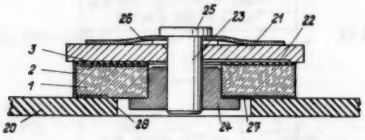
**3,656,033**

## ASSEMBLY COMPRISING AN ADJUSTABLE CAPACITOR AND A PRINTED CIRCUIT

**Francois Nikles, Cornaux, and Henri T. Oguey, Peseux, both of Switzerland, assignors to Centre Electronique Horloger SA, Neuchatel, Switzerland**

**Filed Dec. 7, 1970, Ser. No. 95,634**
**Claims priority, application Switzerland, Dec. 17, 1969, 18730/69**
**Int. Cl. H01g 5/06**
**U.S. Cl. 317—249 D** **7 Claims**




A capacitor, fixed to a printed circuit, comprises a ceramic stator with a continuous metallic layer extending partially over two sides thereof. One side of this layer forms the first plate of the capacitor and the other side is connected to a first part of the printed circuit. A metallic rotor member having a recessed surface is applied by elastic means against a dielectric layer adjacent said one side of the stator. The rotor is mounted on a conducting axle extending through the stator and terminating with a conducting collar protruding from the other side of the stator but not contacting the metallic layer. A connector element, for example either a further conducting layer on the other side of the stator or a spring, connects the collar to a second part of the printed circuit.

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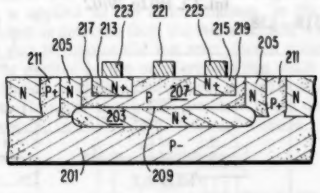
**3,656,034**

## INTEGRATED LATERAL TRANSISTOR HAVING INCREASED BETA AND BANDWIDTH

**Arthur J. Rideout, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jan. 20, 1970, Ser. No. 4,373**
**Int. Cl. H01l 11/06**
**U.S. Cl. 317—235 R** **4 Claims**




An integrated lateral transistor which is easily made symmetrical. An NPN embodiment is constructed on a P— substrate which forms PN junctions with an adjacent N+ buried region and an N epitaxial region within which the N+ region is located. Integral with the substrate is a P+ isolation region which extends to the upper surface of the semiconductor to isolate the N epitaxial layer from adjacent devices. A base region is diffused into the epitaxial region to form a PN junction with the N+ buried region. N+ emitter and collector regions are diffused into the P type base region until the junctions they form with the base are within much less than one diffusion length of the base-buried region PN junction. The emitter and collector are also within two minority carrier diffusion lengths of each other. A similar PNP embodiment is also disclosed.

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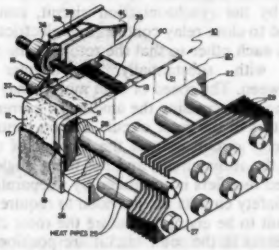
**3,656,035**

## HEAT PIPE COOLED CAPACITOR

**James C. Corman, Scotia, and Peter E. Kelly, South Glens Falls, both of N.Y., assignors to General Electric Company**

**Filed May 4, 1971, Ser. No. 140,193**
**Int. Cl. H01y 1/08**
**U.S. Cl. 317—243** **8 Claims**



In a capacitor in which the electrodes are in the form of elongated conductive sheets separated by elongated dielectric sheets and wound in a compact convolute or roll form with exposed electrodes at each roll edge, heat dissipation is augmented by a chill plate in contact with one of the exposed sheet electrodes at a roll edge and by a plurality of heat pipes connected to the chill plate.

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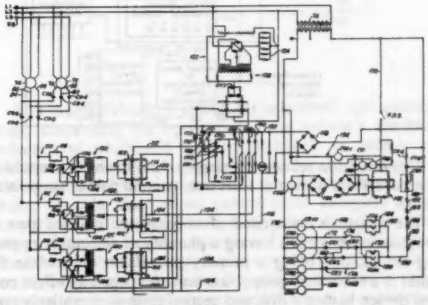
**3,656,036**

## DRIVE MECHANISM FOR AN ENVELOPE MACHINE

**Herbert W. Helm, Hollidaysburg, and Edgar V. Weir, Butler, both of Pa., assignors to F. L. Smithe Machine Company, Inc., Duncansville, Pa.**

**Filed July 2, 1970, Ser. No. 51,764**
**Int. Cl. H02p 5/46**
**U.S. Cl. 318—41** **11 Claims**



Drive for an envelope machine is provided by a pair of wound rotor motors. The motors are mounted adjacent opposite ends of an envelope machine and are drivingly connected to different components of the envelope machine. The motors are electrically connected to each other to drive all of the envelope machine components in proper timed relation to each other to form envelopes from envelope blanks. The wound rotor motors have their stators connected

in parallel and their rotors electrically connected to each other. A rotor circuit is provided and includes resistors and silicon controlled rectifiers. The silicon controlled rectifiers provide speed control for the motors by controlling the current flow through the resistors. A speed control circuit provides for stepless, smooth increase or decrease in the speed of the motors and of the envelope machine components driven thereby. The motors, because of the electrical connection of the rotors to each other, maintain the rotors in substantial alignment with little or no angular displacement between the rotors while the motors are running and driving the envelope machine components. A separate synchronization circuit is provided to rotate one of the rotors while the rotors are not connected to each other to position the rotors in substantial alignment. After the rotors are substantially aligned by the synchronization circuit, control relays are energized to close relay contacts and electrically connect the rotors to each other so that the rotors of the motors are first aligned with substantially no angular displacement therebetween. The speed of both motors may be changed by increasing or decreasing the amount of current flow through the resistors in the rotor circuit. Silicon controlled rectifiers in the rotor circuit control the amount of current flowing through the rotor circuit and the firing angle of the silicon controlled rectifiers is controlled by a separate speed control circuit. Safety circuits are provided to require the speed control circuit to be energized before the rotor circuit is closed. The resistors in the rotor circuit are positioned in the drier for the seal flap adhesive and provide a portion of the heat for the drier.

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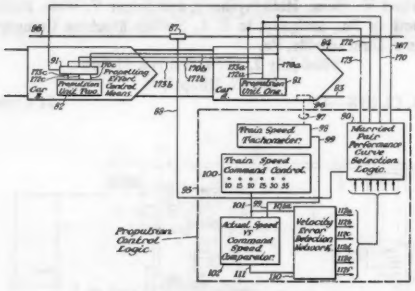
## 3,656,037
## CAR PROPULSION SCHEME UTILIZING MARRIED PAIRS OF PROPULSION UNITS

**George W. Donaldson, McKeesport, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.**

**Filed Mar. 23, 1970, Ser. No. 21,594**
**Int. Cl. H02p** *7/68*
**U.S. Cl. 318—59** **9 Claims**


Train Speed Tachometer
Train Speed Command Control
Married Pair Performance Curve Selection Logic
Actual Speed Vs Command Speed Comparator
Velocity Error Detection Network
Propulsion Control Logic

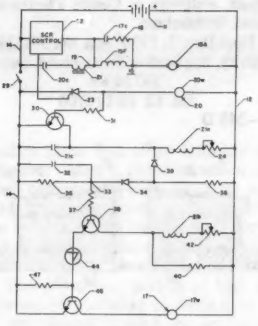
This invention relates to a single or multivehicle propulsion control system having at least one married pair of propulsion units.

The system is comprised of at least one married pair of propulsion units each having a plurality of selectable operating modes, one being a primary propulsion unit, while the other is a secondary propulsion unit. A propelling effort control device having a first and second state is operatively coupled to the secondary unit. A propulsion control logic unit is operatively coupled directly to the primary unit and indirectly to the secondary unit through the propelling effort control means. The propulsion units are controlled by the propulsion control logic unit and propelling effort control means to select a predetermined number of married pair operating modes, the selection of these modes closely approximating the propelling effort required to maintain a preselected vehicle speed relatively free from accelerating and decelerating effects.

## 3,656,038
## FIELD WEAKENING CIRCUIT FOR A SERIES FIELD MOTOR

**Robert G. Ries, Milwaukee, and Robert C. Montross, Mequon, both of Wis., assignors to Square D Company, Park Ridge, Ill.**

**Filed Dec. 4, 1970, Ser. No. 95,047**
**Int. Cl. H02p** *5/16*
**U.S. Cl. 318—139** **13 Claims**




In a control system for a direct current series motor, the contacts of a single throw reed relay are responsive to motor current through a winding in a motor supply conductor to selectively control the application of a motor field weakening shunt resistor by a switching circuit. The charging of a timing capacitor delays action of the switching circuit to prevent motor "hunting". The opening of the reed relay contacts under low motor load conditions permits charging of the capacitor and activating of the switching circuit to place the shunt resistor across the motor field for high speed operation. Under increased motor load, the reed relay contacts close and the capacitor discharges to time the removal of the shunt resistor from across the field. A by-pass transistor by-passes the reed relay contacts preventing activation of the switching circuit until the motor has reached its maximum unweakened field speed and the relay is provided with shunt windings to prevent "chattering" due to wavering motor current.

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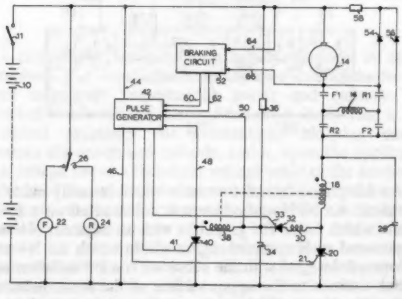
## 3,656,039
## DIRECT CURRENT CONTROL CIRCUIT

**Charles E. Konrad, Roanoke, Va., assignor to General Electric Company**

**Filed Sept. 21, 1970, Ser. No. 73,724**
**Int. Cl. H02p** *29/02*
**U.S. Cl. 318—138** **14 Claims**




A control circuit for controlling the effective power to a load from a power source of substantially constant direct current voltage includes a first or main solid state switching

device for placing the load and the power source in series. Suitable circuitry including a commutating capacitor chargeable in a direction such that its discharge will terminate conduction of the main switching device further includes resistive means serving to maintain the capacitor in constant communication with the power source. Also provided is a means for providing dynamic braking of a direct current motor load through a resistive element such that the armature terminal voltage is adjusted linearly with the speed thereof.

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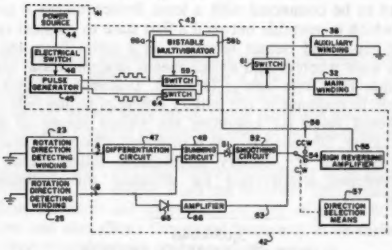
## 3,656,040
## SELF-STARTING SINGLE PHASE MOTOR

**Jirair A. Babikyan, Providence, R.I., assignor to Sanders Associates, Inc., Nashua, N.H.**

**Original application July 2, 1968, Ser. No. 742,002, now Patent No. 3,569,753. Divided and this application Aug. 3, 1970, Ser. No. 67,668**
**Int. Cl. H02d *1/46***
**U.S. Cl. 318—168** **11 Claims**




A permanent magnetic motor is provided having main and angularly displaced auxiliary windings and means for detecting the direction of rotation of the motor's permanent pole rotor and for producing control signals to cause the motor to rotate in a desired direction. The structure for detaching the rotor rotational direction comprises two separate electrical windings which inductively coupled with the magnet piece of the rotor so that when the rotor rotates, voltages are induced in both of the windings, which voltages are compared to determine whether the rotor is moving in a clockwise or counterclockwise direction of rotation. If the desired direction of rotation is detected, then the input signal applied to the main winding is not altered. If the direction of rotation is opposite to the desired rotation, then a signal of opposite polarity is applied to the main windings. In the event no signal output is detected from the two electrical windings, indicating that the motor did not start, then a pulse of either polarity is applied to the auxiliary winding, such that it initiates rotation, and then direction is sensed and controlled, as above. Thus, the motor may be started and once started may be rotated in a selected direction of rotation.

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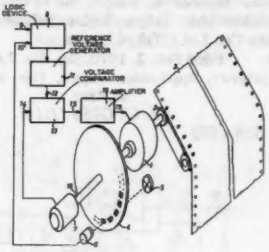
## 3,656,041
## APPARATUS FOR CONTROLLING THE FEEDING OF PAPER IN HIGH-SPEED PRINTERS

**Giorgio Bonzano, Caluso, Italy, assignor to Honeywell Information Systems Italia S.p.A., Turin, Italy**

**Filed July 14, 1970, Ser. No. 54,815**
**Claims priority, application Italy, July 17, 1969, 19733 A/69**
**Int. Cl. G05b *5/00*; H02p *5/00*; B41j *15/00***
**U.S. Cl. 318—318** **4 Claims**

Apparatus for controlling the paper feeding in printing apparatus, wherein the feed motor speed is controlled by the combined effect of a speed-space detector whose output is speed-proportional voltage and said pulses are compared with a predetermined pulse number, and wherein the results of said comparison are employed in combination to provide a




suitable paper feed power control through a bidirectional amplifier which does not require a stabilized power supply.

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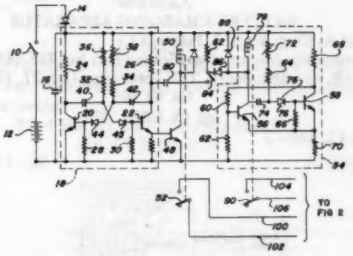
## 3,656,042
## AUTOMATIC COMBINATION WINDSHIELD WIPER-WASHER

**Murakami Keisuke, Tokyo, Japan, assignor to John Y. Sugihara, Streamwood, Ill.**

**Filed Apr. 14, 1971, Ser. No. 133,871**
**Int. Cl. B60s *1/46***
**U.S. Cl. 318—444** **8 Claims**

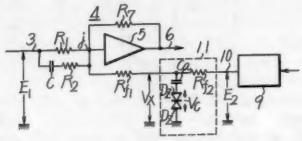



In a motor vehicle, a circuit for selectively and automatically controlling the operation of the vehicle's windshield wipers and windshield washers including an astable multivibrator circuit which generates wiper control pulses, both the duration of which pulses and the interval therebetween being variable. Each wiper control pulse energizes a wiper control relay, the contacts of which, when closed, energize a wiper motor to initiate operation of the windshield wipers. Simultaneously with each wiper control pulse, the astable multivibrator also generates a pulse inverted with respect thereto. A monostable vibrator multivibrator is connected to receive the inverted pulse from the astable multivibrator through a selectively operable manual switch. The inverted pulses are differentiated, and the resulting impulses trigger the washer control monostable multivibrator which generates a washer control pulse in response to each impulse. A washer control relay is energized by each washer control pulse for the duration of each said washer control pulse to close associated contacts connected across a washer pump motor thereby energizing the windshield washer pump.

## 3,656,043
## STEERING SYSTEM WITH AUTOMATIC INCREASE OF RATE TIME

Shin-ichi Kawada, Yokohama; Yoichi Hirokawa, Kamakura, and Isao Masuzawa, Tokyo, all of Japan, assignors to Kabushikikaisha Tokyo Keika Seizosho (Tokyo Keiki Seizosho Co., Ltd.), Tokyo, Japan

Filed Feb. 2, 1970, Ser. No. 7,631
Claims priority, application Japan, Feb. 8, 1969, 44/9388; 44/9389
Int. Cl. G05b *11/14*
U.S. Cl. 318—588 5 Claims

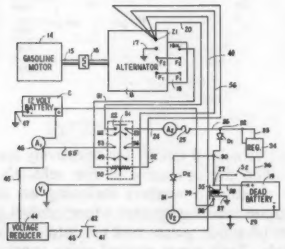


An automotive steering system including means for producing a commanded course change which is the difference between the preset course and a desired course and including an operational unit capable of accomplishing proportional and differential control and having rate feedback and in which a position feedback signal is applied to the input of the operational unit through a circuit which has a dead zone feature such that when the position feedback signal exceeds a predetermined level the time constant of the operational unit is changes so as to prevent over-shoot of the autopilot when making large corrections.

## 3,656,044
## BATTERY CHARGING APPARATUS

Ansel A. King, Route 3, Pelzer, S.C.

Continuation-in-part of application Ser. No. 785,485, Dec. 20, 1968, now abandoned. This application Oct. 27, 1970, Ser. No. 84,269
Int. Cl. H02k *5/00*
U.S. Cl. 320—2 2 Claims

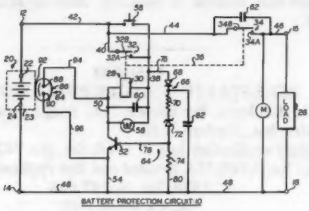



A self-contained portable apparatus for charging dead batteries. The apparatus includes an alternator which is driven by a gasoline motor. A first circuit which includes cables extends from the alternator to the dead external battery. A charge initiating battery is mounted on the chassis, and is included in a second parallel circuit. The charge initiating battery energizes the alternator for causing such to begin charging the dead external battery. A third circuit is provided for regulating the voltage from said alternator so that the apparatus can be used to charge different potential batteries.

## 3,656,045
## BATTERY PROTECTION CIRCUIT

James Frezzolini, and James J. Crawford, both of Ringwood, N.J., assignors to Frezzolini Electronics Inc., Hawthorne, N.J.

Filed Apr. 16, 1971, Ser. No. 134,614
Int. Cl. H02l *3/20*
U.S. Cl. 320—34 11 Claims

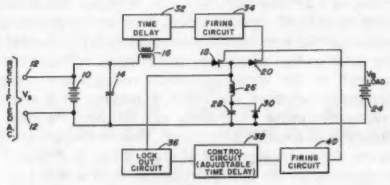



The circuit comprises a pair of input terminals adapted to be connected with a battery and a pair of output terminals adapted to be connected with a load. Switch means is provided which is operable between a first state to connect said pair of input and output terminals in a series loop and a second state wherein said switch means disconnects at least one input from one output terminal. Disconnect means is operable in response to the battery potential falling below a preselected value for operating the switch means to the second state. Disabling means is provided which is operable in response to the battery temperature falling below a predetermined temperature for disabling the disconnect means.

## 3,656,046
## POWER CONVERSION SYSTEM

Harry G. Parke, Brooklyn, N.Y., assignor to Galbraith-Pilot Marine Corp., Brooklyn, N.Y.

Filed June 18, 1970, Ser. No. 47,314
Int. Cl. H01m *45/05*; H02m *7/44*
U.S. Cl. 320—59 9 Claims




A circuit for obtaining power from a source and delivering a lower D.C. voltage to a load. A first silicon controlled rectifier is fired to charge up a series resonant circuit to approximately twice the input voltage. When the capacitor is fully charged, a signal fires a second silicon controlled rectifier to discharge the capacitor into the load. When the potential on the capacitor and its associated inductance has been reduced to the proper point, the second rectifier cuts off to end the cycle.

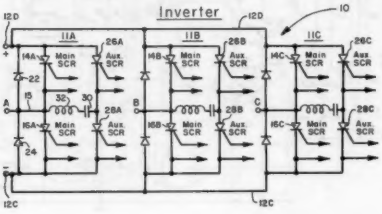
## 3,656,047
## MULTI-PHASE INVERTER USING ISOLATED DIRECT CURRENT SUPPLIED FOR FIRING THE SCRS

Raymond J. Yarema, La Grange Park, and George H. Studtmann, Mount Prospect, both of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Feb. 4, 1971, Ser. No. 112,527
Int. Cl. H02m *7/52*
U.S. Cl. 321—5 14 Claims

An impulse commutated, variable output frequency, multiphase inverter type of power switching system employing

main SCRs to handle the primary output currents and auxiliary SCRs to aid in commutating the main SCRs is disclosed wherein the firing of the SCRs is done by using isolated direct current supplies. Each SCR is fired by a separate driving circuit which includes individual isolated direct current supply and a switch unit to connect that supply directly to the gate-cathode circuit of the associated SCR. The control circuitry includes an oscillator whose output frequency is selectively variable, and a three-phase square-wave generator driven by the oscillator which produce two square-waves, one the inverse of the other, for each phase. Each of these six




outputs of the generator drives a pulse and a delay pulse circuit which respectively produce a first pulse and a delayed second pulse in response to each change of polarity of the particular square-wave input. These pulse and delay pulse are inductively coupled to different ones of the multivibrator circuits to turn on the switch unit and to "fire" an SCR in accordance with a predetermined sequence so as to generate a three-phase a.c. output from the inverter. This arrangement allows for short rise times and fast turn-off of the SCR gate drive and also allows the output frequency to be varied over a large range from d.c. to large values.

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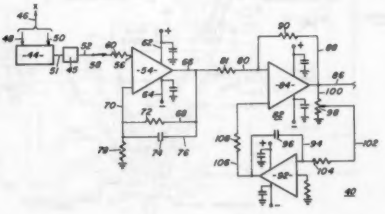
**3,656,048**

## NON-LINEAR EXCITER CONTROLLER FOR POWER SYSTEM DAMPING

**Adolf W. Hauf, Bonneville Power Administration, Lewiston, Idaho, assignor to The United States of America as represented by the Secretary of the Interior**

**Filed July 16, 1970, Ser. No. 55,541**
**Int. Cl. H02p 9/32**
**U.S. Cl. 322—19** **4 Claims**



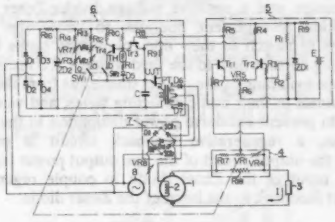
Damping of power system oscillations is accomplished by additionally directing exciter-voltage regulation for individual system generators in accordance with variations in the derivative of reactive power generated by a generator. Signal voltage proportional to reactive power in generator output is differentiated to develop a signal voltage representing rate of change of reactive power variations which is applicable as an auxiliary input for determining operational control of exciter-voltage regulation of the generator. Control for suppressing system oscillations is continuous as long as generator bus voltage does not exceed pre-set upper and lower voltage limits.

**3,656,049**

## VOLTAGE REGULATING DEVICE FOR GENERATORS

**Kenji Hazumi, Tokyo, Japan, assignor to Sawafuji Electric Co., Ltd., Tokyo, Japan**

**Filed Dec. 10, 1969, Ser. No. 883,829**
**Claims priority, application Japan, Dec. 26, 1968, 43/96169**
**Int. Cl. H02r 9/26**
**U.S. Cl. 322—27** **5 Claims**



A voltage regulating device for generators comprising a circuit for detecting the current through a load of a generator; an amplifier circuit for amplifying the output voltage of said load current detecting circuit and a phase control circuit which is driven by the output of said amplifier circuit for controlling the conduction starting phase of the exciting current of the generator in response to the characteristic of the load so as to control the output voltage of said generator and SCR-diode bridge circuit. The output pulses from said phase control circuit lag behind when the load current is high while the output pulses advance when the load current is low, so that the generator may have the characteristic that its output voltage may be dropped at a very steep slope when the load current is increased.

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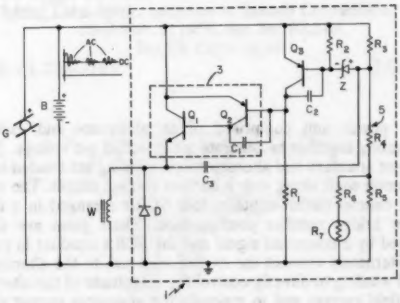
**3,656,050**

## TRANSISTORIZED VOLTAGE REGULATOR CIRCUIT

**John M. Airey, Winchester, Mass., assignor to GTE Laboratories Incorporated**

**Filed May 25, 1970, Ser. No. 40,157**
**Int. Cl. H02p 9/30**
**U.S. Cl. 322—28** **14 Claims**



A transistorized voltage regulator circuit employing regenerative feedback for controlling current flow through the field winding of a dc generator or alternator such as commonly employed in conjunction with a storage battery in automotive vehicles. When the voltage across the terminals of the storage battery, comprising both a dc voltage portion and a superimposed periodic ac voltage portion, has a value less

than a predetermined regulation value, current is provided to the field winding by means of a complementary pair of output transistors including a low-cost npn output power transistor connected in series with field winding and a pnp output transistor interconnected with the npn output power transistor so as to provide maximum current flow to the field winding.

When the voltage across the terminals of the storage battery reaches a value which equals or exceeds the predetermined regulation value, a control circuit including a pnp control transistor and a resistive voltage-divider-Zener breakdown diode arrangement operates to cause the output transistors to switch to their non-conducting states thereby terminating current flow to the field winding. To insure rapid and abrupt switching of the output transistors from their conducting states to their non-conducting states, and vice versa, thereby to prevent excessive power dissipation in the output transistors, a regenerative feedback circuit is provided between the output circuit of the npn output power transistor and the input of the Zener diode to couple regenerative (positive) feedback to the input of the Zener diode.

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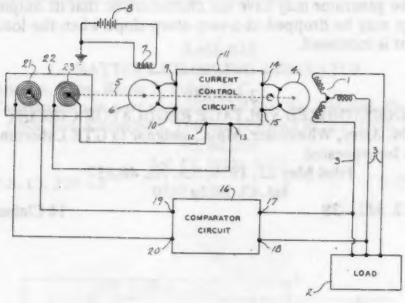
**3,656,051**

## FAST RESPONSE FEEDBACK CONTROLLED GENERATOR

**Aloysius W. Pratt, New Carlisle, Ohio, assignor to Kohler Co., Kohler, Wis.**

**Filed July 20, 1970, Ser. No. 59,775**
**Int. Cl. H02p 9/30**
**U.S. Cl. 322—28** **11 Claims**



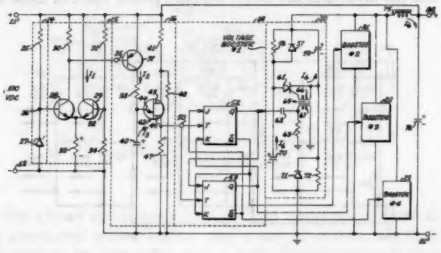

A power unit comprised of an alternator and exciter operating together to generate a controlled a-c voltage. The exciter armature and alternator field winding are rotated on a common shaft along with a current control circuit. The current control circuit contains four SCR's arranged in a full-wave bridge rectifier configuration. Their gates are controlled by a command signal and the SCR's conduct in pairs to alternately connect the exciter armature to the alternator field winding to directly control the magnitude of the alternator field current and to maintain the alternator output voltage at a predetermined level. A comparator circuit generates a train of pulses which constitute the command signal and control the firing of the SCR's. The timing, or phase relationship of these pulses is determined by the magnitude of the alternator output voltage. The command signal is conveyed from the stationary comparator circuit to the current control circuit by a transceiver comprised of a stationary primary winding and a rotating secondary winding, both wound concentric to the axis of shaft rotation.

**3,656,052**

## APPARATUS FOR PROVIDING REGULATED VOLTAGE DURING BRIEF POWER INTERRUPTIONS

**Luther L. Genuit, Scottsdale, and John R. Nowell, Phoenix, both of Ariz., assignors to Honeywell Information Systems Inc., Waltham, Mass.**

**Filed Jan. 4, 1971, Ser. No. 103,625**
**Int. Cl. G05f 1/56, 1/62**
**U.S. Cl. 323—17** **9 Claims**



A plurality of voltage boosters connected to a D.C. power supply each stores a quantity of electrical charge while the power supply provides a regulated value of output voltage. When the output voltage of the supply decreases below a predetermined value the boosters are sequentially connected to the D.C. supply and return substantially all of the stored charges to the supply, so that the output voltage increases to the regulated value.

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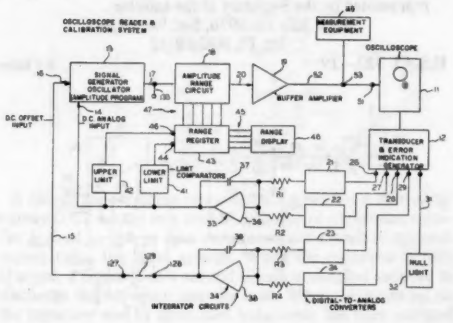
**3,656,053**

## OSCILLOSCOPE READER AND CALIBRATION SYSTEM

**Peter Richman, Lexington, Mass., assignor to Teradyne Applied Systems, Inc., Chicago, Ill.**

**Filed Feb. 2, 1970, Ser. No. 7,659**
**Int. Cl. G01r 31/22, 13/20**
**U.S. Cl. 324—20** **35 Claims**

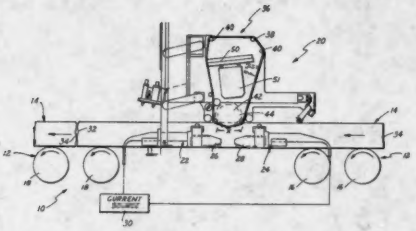



An oscilloscope reader and calibration system. The system comprises a closed loop including signal generator means for feeding variable signals into the oscilloscope. Light sensitive transducer means are arranged to detect the desired parameters of the oscilloscope displayed signal. Responsive thereto control signals are generated which vary the input signal to the generator and thus change the output signal from the generator. The output signal serves as the calibration input to the scope. When a null is obtained, no signal variation occurs. In the null condition the error in calibration is easily measured or utilized for corrective action even by unskilled personnel.

## 3,656,054
## LEAKAGE FIELD FLAW DETECTOR WITH CURRENT ENERGIZATION WITH MEANS TO CONTROL CURRENT ENERGIZATION BY PROBE SCAN

Friedrich M. O. Forster, Der Schoene Weg 144, 741 Reutlingen, Germany

Filed July 14, 1969, Ser. No. 848,388
Int. Cl. G01r 33/12
U.S. Cl. 324—37 5 Claims

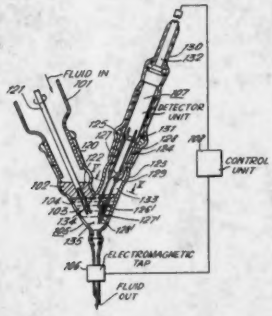



A nondestructive testing apparatus and method are disclosed herein for testing objects by measuring the stray magnetic flux field adjacent the surface thereof. The workpiece is magnetized by means of a pulsed electric current circulating therethrough during a portion of the test interval whereby the magnetizing is accomplished with a minimum amount of power. The amount of magnetizing power required is further reduced by recording the stray fields on a magnetic medium such as a flexible tape and subsequently scanning the tape with a suitable magnetic pickup probe.

## 3,656,055
## INTERFACE DETECTION APPARATUS HAVING A SIDE ARM DETECTOR WITH THREE ELECTRODES

Phillip Harvey Jilbert, Tadley, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Oct. 6, 1969, Ser. No. 863,956
Claims priority, application Great Britain, Oct. 15, 1968, 48,918/68
Int. Cl. G01r 27/26
U.S. Cl. 324—61 R 11 Claims

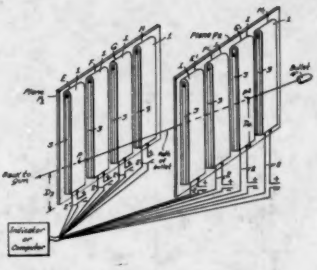



To detect the interface between two fluids (two liquids or a gas and a liquid) flowing in a duct and having different electrical properties, three electrodes are located at a position along the duct, two of the electrodes forming with the third a pair of capacitors displaced from one another in the direction of flow so that substantially separate fluids are present between the electrodes forming the respective capacitors at a given position of the interface. The two capacitors form two arms of an AC bridge and a circuit detects the out-of-balance output from the third electrode when the interface reaches the electrodes. Preferably the electrodes are formed by three insulated wires extending into the duct from a side-arm to leave an air-pocket between the liquid surface and the surface from which the wires extend. The apparatus has application in liquid phase-separation apparatus for chemical analysis.

## 3,656,056
## BULLET HOLE LOCATOR-RESISTANCE TYPE

Eugene W. Dalzell, Jr., Pittsfield, Mass., assignor to The United States of America as represented by the Secretary of the Army

Filed Apr. 7, 1969, Ser. No. 814,130
Int. Cl. G01r 27/02; G01l 5/14
U.S. Cl. 324—65 R 1 Claim

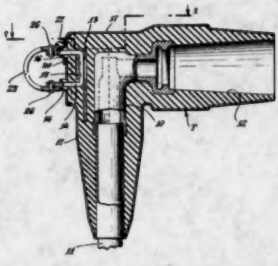



The point at which a bullet or other passing object passed a line may be determined by the present invention. Or, the direction from which the object came, is ascertained by comparing the points at which the object passed spaced-apart lines or planes. Electrical resistance type elements, connected to an indicator or computor, indicate the points at which the object passed two or more lines or planes. As exemplary, one can determine the direction a bullet came from which struck a helicopter.

## 3,656,057
## SAFETY TERMINATOR WITH TESTING AND PULLING MEANS

Carlo Bruno De Luca, Monroe, Conn., and Allan Mallanik, Spring Lake, Mich., assignors to Burndy Corporation

Filed Nov. 5, 1970, Ser. No. 87,240
Int. Cl. G01r 19/16
U.S. Cl. 324—133 5 Claims



A terminator is equipped with a ring whereby it may be pulled off a contact such as the electrode of a transformer. The ring is pivoted to a metal bracket extending outside the terminator from a capacitor plate embedded within the body

of the terminator in closely spaced relation to a current carrying contact also within the terminator body. Therefore, a suitable tool applied to the ring or the bracket can indicate whether or not the terminator contact is conducting electricity. While the terminator body is covered by a conductive coating, the bracket extends through an uncoated part of the terminator surface so as to be capable of being charged with the capacitor. When the ring is to be used for pulling the terminator, it must be grounded to the coated terminator surface to permit its safe use.

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**3,656,058**

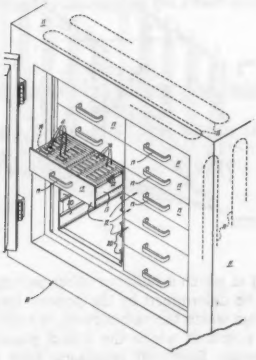
**ENVIRONMENTAL TEST BED ASSEMBLY FOR MINIATURE ELECTRONIC COMPONENTS**

**Claude L. Leathers, 1364 Wylie Way, San Jose, Calif.**

**Filed July 2, 1969, Ser. No. 838,464**

**Int. Cl. G01r** *31/22;* **H02b** *1/04*

**U.S. Cl. 324—158 F** **4 Claims**



A test bed assembly for use in conjunction with an environmental test oven employs a readily removable tray assembly which carries support or mounting boards arranged in spaced parallel relation. The mounting boards are connected at their bottoms to ride upon electrically active rods and, at their upper edge, are arranged to carry readily removable test sockets.

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**3,656,059**

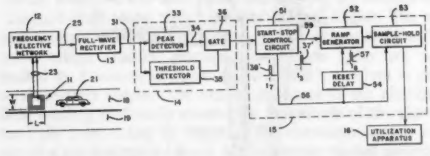
**SINGLE SENSOR MOTOR VEHICLE VELOCITY DETECTOR**

**Scott M. Overstreet, Los Altos, Calif., assignor to Sylvania Electric Products, Inc.**

**Filed May 25, 1970, Ser. No. 40,247**

**Int. Cl. G01p** *3/54*

**U.S. Cl. 324—173** **3 Claims**




In this detector, the sinusoidally varying signal voltage induced in an inductive sense loop by a ferromagnetic motor vehicle passing over it is adjusted by a low pass filter having a 6 db. per octave high frequency roll off characteristic in order to obtain a signal waveform of essentially uniform amplitude regardless of vehicle velocity. The frequency of the initial portion of the induced signal, which is proportional to the vehicle velocity, is measured by sequentially detecting two successive peak transitions of the filtered signal and measuring the time interval therebetween.

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**3,656,060**

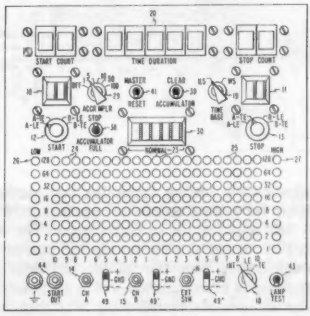
**TIME INTERVAL MEASURING AND ACCUMULATING DEVICE**

**Carl J. Bauernfeind, and Raymond F. Zeman, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Continuation of application Ser. No. 791,613, Jan. 16, 1969, now abandoned. This application Jan. 15, 1971, Ser. No. 106,874**

**Int. Cl. G04f** *9/00*

**U.S. Cl. 324—186** **7 Claims**




A device for electronically measuring a series of time periods and accumulating all measurements obtained in a visual display for further processing or evaluation. The device can measure the time between leading and trailing edges of a single pulse, the interval between different pulses within a train of pulses or the interval between pulses in one pulse train to pulses in different pulse trains and store the measurements obtained until the maximum capacity for the accumulator for any value or value range is attained. Further the input channels may be controlled to identify the input pulse trains in a variety of predetermined ways according to commonly considered wave forms.

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**3,656,061**

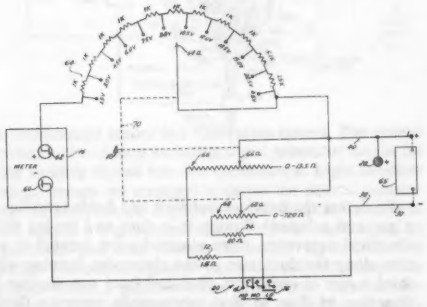
**PORTABLE BATTERY TESTER WITH MEANS TO SIMULATE NORMAL OPERATING DRAIN CONDITIONS**

**Henry Rogers Mallory, Greenwich, Conn., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.**

**Filed June 11, 1970, Ser. No. 45,524**

**Int. Cl. G01n** *27/42*

**U.S. Cl. 324—29.5** **4 Claims**




A portable battery tester with a meter to measure the battery voltage through a series resistor adjusted to limit the current to the meter to the operating range of the meter, and

with variable shunt resistors adjustable to a value that will simulate the load conditions to which the battery is to be applied, to simulate the current drain for that usage.

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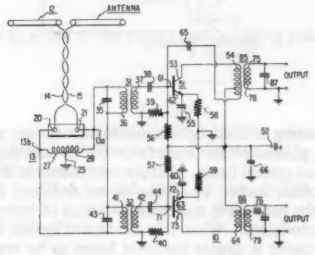
3,656,062

## LIGHTNING PROTECTION SYSTEM

Steven Wlasuk, Blackwood, N.J., assignor to RCA Corporation

Filed Mar. 26, 1969, Ser. No. 810,606
Int. Cl. H04b 1/06
U.S. Cl. 325—362 4 Claims




The destructive effects of electrical storms in destroying the input stage of a receiver including active devices when coupled to an antenna is minimized by the use of a suitable saturable reactance coupled between the antenna terminals and the first stage of the receiver.

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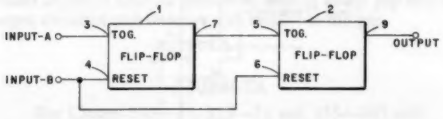
3,656,063

## DIGITAL FREQUENCY COMPARATOR

Donald W. Vollmer, Livermore, Calif., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Apr. 29, 1970, Ser. No. 32,948
Int. Cl. H03d 13/00
U.S. Cl. 328—133 2 Claims




A digital frequency comparator circuit whose output is the frequency difference between two input signals and which consists of two flip-flops triggered by the negative going portion of the input waveform connected in a divide-by-four configuration and where the reset output is energized whenever coincident input signals arrive at the first flip-flop's toggle and reset inputs. The circuit produces an output pulse whenever two consecutive negative going portions of an input waveform arrive at the toggle input without an intervening negative going portion of a second input waveform arriving at the reset input of the first flip-flop.

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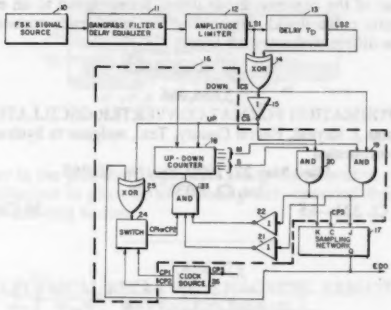
3,656,064

## DATA DEMODULATOR EMPLOYING COMPARISON

George R. Giles, Williamsville, and Donald G. Shuda, Clarence Center, both of N.Y., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Sept. 17, 1969, Ser. No. 858,627
Int. Cl. H04l 27/14
U.S. Cl. 329—104 12 Claims

Data demodulator which demodulates a received signal by means of comparing the received signal with itself delayed to produce a comparison signal having one amplitude value upon identity and another different amplitude value upon non-identity. The comparison is performed by a modulo two net-work herein illustrated as an EXCLUSIVE OR gate. The comparison signal is filtered by a digital filter which includes




an UP/DOWN counter and associated control circuitry. The output of the digital filter is sampled by a JK flip-flop to provide the demodulated data signal.

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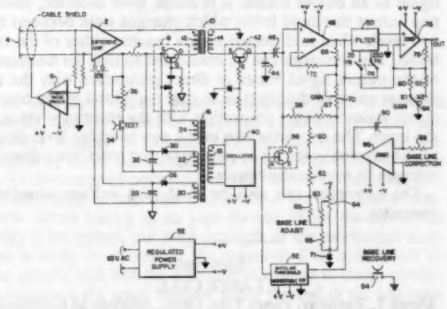
3,656,065

## BIO-POTENTIAL ISOLATED AMPLIFIER

Clyde J. Reinhard, La Habra Heights, and Donald D. Miller, Long Beach, both of Calif., assignors to Beckman Instruments, Inc.

Filed June 12, 1970, Ser. No. 45,848
Int. Cl. H03f 3/38
U.S. Cl. 330—10 7 Claims




A floating differential input amplifier is connected through a first field-effect transistor gate to an input winding of a signal transformer. An oscillator is connected to a primary winding of a power isolation transformer which transformer has one secondary winding connected to a rectifier circuit which in turn is connected to supply bias power to the differential amplifier. Another secondary winding of the power isolation transformer is connected to operate the first field-effect transistor gate. The output winding of the signal transformer is connected through a second field-effect transistor gate in series with a coupling capacitor to the input of a potentiometric operational amplifier. The potentiometric operational amplifier is connected to a filter amplifier and an overload detection circuit. An integrating amplifier is connected between the output of the filter amplifier and the input of the potentiometric operational amplifier to provide DC base line correction. The overload detection circuit is connected to operate a field-effect transistor switch connected to the input of the potentiometric operational amplifi-

er and through which the input coupling capacitor can be rapidly charged. A common-mode driver amplifier has one input connected through a resistance network to the inputs of the floating differential amplifier and the other input connected to the common ground of the output circuitry. The output of the common mode driver is connected to an electrostatic cable shield surrounding the input leads connected to the differential amplifier inputs.

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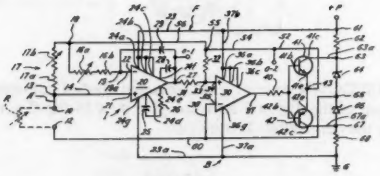
**3,656,066**

**INFORMATION FORMAT CONVERTER-OSCILLATOR**

**Thomas J. Reynal, Harris County, Tex., assignor to Systronics Incorporated**

**Filed May 27, 1970, Ser. No. 40,965**
**Int. Cl. H03k 3/28**
**U.S. Cl. 331—65** **26 Claims**



Information format converter receives input information represented by variable input resistance and converts this input information into an output signal whose frequency varies in accordance with the input information. A charge storage means charges over a time period in accordance with the resistance value of the input resistance and provides a signal to an output means, a bi-stable level detector, having two output threshold levels which changes state between the two levels when said storage means reaches either of the two levels. The converter can be connected so that the frequency of the output signal varies in direct proportion with the resistance value of the input or so that the period of the output signal varies in direct proportion with the resistance value of the input. The converter also uses a new bi-stable level detector which eliminates the requirement that precision reference voltages be used in the converter.

The converter can also be used as a voltage waveform generator.

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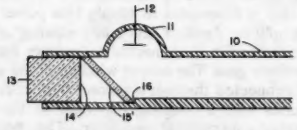
**3,656,067**

**LASER CELL**

**Alfred T. Zavodny, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.**

**Filed May 8, 1970, Ser. No. 35,781**
**Int. Cl. H01s 3/08**
**U.S. Cl. 331—94.5** **3 Claims**



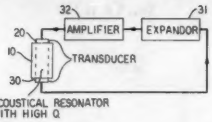
A fluid-filled amplifier cell for laser generation comprises an elongated housing wherein at least one end contains, within the cell, a window supported at the Brewster angle and wherein such end is plugged with a mirror.

**3,656,068**

**RESONANT SELF-PULSING ACOUSTO-OPTICAL MODULATOR**

**Peter Klaus Runge, Fair Haven, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.**

**Filed Dec. 3, 1970, Ser. No. 94,647**
**Int. Cl. G02f 1/28**
**U.S. Cl. 331—94.5** **12 Claims**




A self-pulsing acousto-optical modulator system produces acoustical pulses in the modulator which are capable of deflecting an optical beam. Multiple resonances in the modulator are phase locked by means of an electrical feedback path, thereby producing a continuous series of traveling pulses in the modulator. When this modulator system is placed in a laser cavity it causes the laser beam to be repetitively switched out of the cavity, producing laser pulses.

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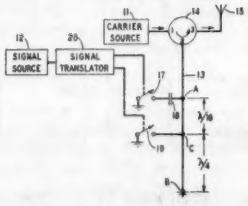
**3,656,069**

**MULTIPHASE DIGITAL MODULATOR**

**John Peter Beccone, Middlesex; Kaneyuki Kurokawa, Murray Hill, and Wolfgang Otto Schlosser, Basking Ridge, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.**

**Filed July 15, 1970, Ser. No. 55,116**
**Int. Cl. H03c 3/00**
**U.S. Cl. 332—16 R** **9 Claims**




In one embodiment, high-speed phase modulation is provided by directing a microwave carrier into the first port of a circulator, reflecting it from variable locations of a reflecting transmission line connected to the second port, and directing it from the third port to a load. By selectively switching diodes, one directly connected, and one capacitively connected, to the reflecting line, four-level phase digital modulation is obtained.

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**3,656,070**

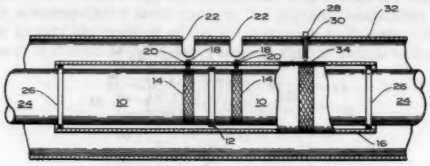
**VARIABLE AXIAL RATIO COMPENSATOR**

**Stephen R. Monaghan, Harvard, and James D. Birch, Townsend, both of Mass., assignors to The United States of America as represented by the Secretary of the Navy**

**Filed June 21, 1971, Ser. No. 155,052**
**Int. Cl. H01p 1/16, 3/12**
**U.S. Cl. 333—21 A** **5 Claims**

A device which compensates for polarization quality defects in circularly polarized or two-mode duplexed waveguide systems by making an elliptically polarized wave circularly polarized. Two adjacent, coaxial, elliptical waveguide sec-

tions are adjusted to give the correct axial ratio. The two elliptical waveguide sections are then locked together and rotated to arrive at the proper compensating polarization angle.



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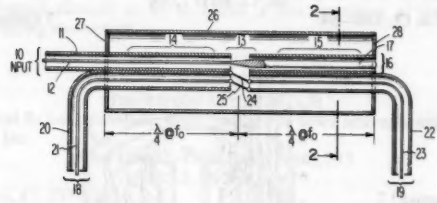
**3,656,071**
**WIDE BAND BALUN**
**Oakley McDonald Woodward, Princeton, N.J., assignor to RCA Corporation**
**Filed June 25, 1970, Ser. No. 49,745**
**Int. Cl. H01p** *5/10*
**U.S. Cl. 333—26** **8 Claims**



A wide band balun for connecting an unbalanced coaxial input line to a balanced load. The input line is separated into a first and a second portion by a gap in its outer conductor. The balun achieves wide band operation by the use of two short circuited stubs in shunt with respect to the gap and an open circuited stub in series with respect to the gap.

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**ERRATA**

For Classes 333—31, 333—71 and 335—205 see: Patent Nos. 3,656,179 thru 3,656,181

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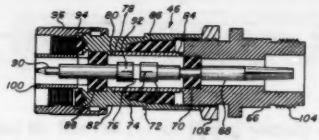
**3,656,072**
**COAXIAL ASSEMBLY FOR MOUNTING A VARACTOR DIODE**
**David R. Ludwig, Randolph, and David A. Sherman, Sudbury, both of Mass., assignors to Walter J. Kreske, Newton Centre, Mass.**
**Continuation of application Ser. No. 677,466, Oct. 23, 1967, which is a continuation of application Ser. No. 478,499, May 24, 1965, which is a division of application Ser. No. 101,441, Apr. 7, 1961, Pat. No. 3,194,976. This application July 25, 1969, Ser. No. 854,336**
**Int. Cl. H01p** *5/00*
**U.S. Cl. 333—97 R** **1 Claim**

A subcombination of a coaxial broadband frequency multiplier, the subcombination consisting of coaxial connector jack and plug bodies connected together in electrical engagement with each other and having an axially aligned opening through the entire jack and plug bodies, the opening carrying along the axis thereof a varactor having oppositely disposed terminals with a first center conductor in electrical engagement with one of the terminals and extending axially in one direction in the opening and a second center conductor in electrical engagement with the other terminal and extending axially in the opposite direction in the opening, and an insulator in the jack and plug bodies fixing the respective center conductors in place in the opening and separated from the jack and plug bodies.



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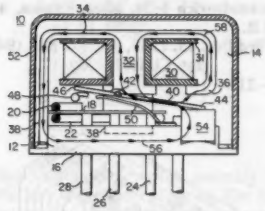
**3,656,073**
**ELECTRICAL RELAY WITH MAGNETIC ARMATURE RETENTION MEANS**
**Arthur Eastman Wood, Rolling Hills; Ralph Edward Marvin, Long Beach, and Ralston Everett Bates, Los Alamitos, all of Calif., assignors to Teledyne, Inc., Los Angeles, Calif.**
**Filed Sept. 25, 1970, Ser. No. 75,541**
**Int. Cl. H01h** *51/00*
**U.S. Cl. 335—179** **6 Claims**



A miniature electric relay is disclosed which includes a header member made of magnetic material. A small permanent magnet is mounted on the header member immediately under the armature such that when the armature is in its de-energized position, one end thereof contacts the permanent magnet and thus completes a low reluctance magnetic circuit having no air gaps therein. When the coil of the relay is energized, the weak strength of the permanent magnet is easily overcome by the magnetic field established by the electric coil and the armature is rotated to cause contact actuation in the usual manner. Once the end of the armature is removed from the permanent magnet and an appreciable air gap exists, the permanent magnet is of sufficiently small strength to cause no appreciable forces on the armature, and thus the presence of the permanent magnet does not require an appreciable stronger coil to overcome its effect. A conventional return spring is provided to return the armature to its de-energized position once the coil is de-energized.

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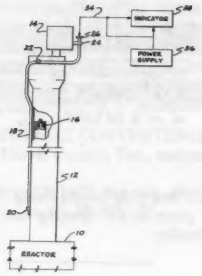
**3,656,074**
**CONTROL ROD POSITION TRANSMITTER**
**Frank Bevilacqua, Windsor, and Herbert A. Runde, Windsor Locks, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.**
**Filed Nov. 14, 1968, Ser. No. 775,638**
**Int. Cl. H01h** *36/02*
**U.S. Cl. 335—206** **14 Claims**

Apparatus for sensing and transmitting, to an indicating means, the position of a movable member comprising a magnet which moves with the member, a plurality of flux responsive switches individually positioned along a line parallel to

the path of movement of the member, and a potentiometer electrically connected to the switches to provide a signal




commensurate with the position of the member. The signal may then be transmitted to a position indicating device.

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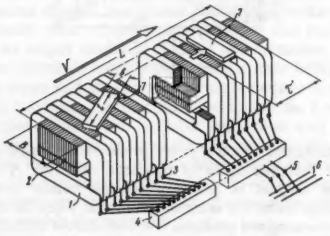
**3,656,075**

**APPARATUS FOR CONVEYING ELECTRICALLY CONDUCTIVE NON-MAGNETIC BODIES BY A MAGNETIC FIELD WHILE SIMULTANEOUSLY ORIENTING THE BODIES**

**Benyamin Alexandrovich Ioffe, ulitsa Raunsa, 45/2, kv. 81, Riga, U.S.S.R.**

**Filed Dec. 15, 1969, Ser. No. 885,194**
**Int. Cl. H01f 1/00**
**U.S. Cl. 335—219** **5 Claims**



The device for conveying electrically conductive non-magnetic bodies with a concurrent orienting thereof comprises an inductor wherein the number of ampere-turns of its winding, the pole pitch and the width of the effective zone thereof are so selected as to create electrodynamic forces in excess of the resistance forces exerted upon the conveyed bodies during their being moved and turned. The pole pitch however, is equal to or greater than the width of the body being oriented.

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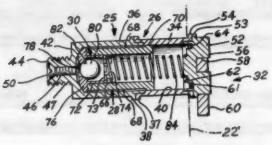
**3,656,076**

**TIME DELAY ELECTROMAGNETIC DEVICE**

**Robert E. Prouty; John E. Gilman, III, and James J. Smith, all of Logansport, Ind., assignors to Essex International, Inc.**

**Filed Feb. 2, 1970, Ser. No. 7,598**
**Int. Cl. H01f 7/10**
**U.S. Cl. 335—240** **14 Claims**

A time delay electromagnetic device includes a core for an electromagnetic coil having a tubular sleeve comprising a magnetizable and a non-magnetizable portion which is sealed at one end by a magnetizable pole piece and substantially filled with a damping liquid. A magnetizable plunger is positioned within the sleeve and includes a ball retaining cage and ball check valve positioned in a passage extending through the plunger. The cage is closed at one end and includes an aperture therein. When the plunger is attracted to the pole piece, the ball check valve blocks the flow of the liquid through the passage, causing the liquid to pass through



a small space between the plunger and the sleeve to delay the movement of the plunger toward the pole piece.

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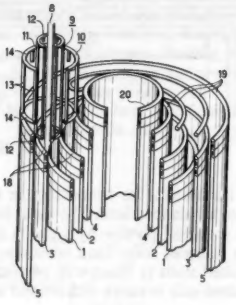
**3,656,077**

**DISTRIBUTION OF EQUIPOTENTIAL SURFACES OF INDUCTANCE WINDINGS COMPRISING LAYERS WITH A DOUBLE SERIES OF STEPS**

**Georges Laser, Garches, and Daniel Bornet, Paris, both of France, assignors to Alsthom-Savoisienne**

**Filed Sept. 8, 1970, Ser. No. 70,166**
**Claims priority, application France, Sept. 8, 1969, 6930723**
**Int. Cl. H01f 15/04**
**U.S. Cl. 336—84** **7 Claims**



A simply-built device for distributing the potential around a high-voltage output conductor and at the ends of the layers of windings of an inductor coil or of a transformer consisting of windings in layers arranged in a double step configuration on either side of a middle layer which is the shortest and to which is connected the high-voltage output. It consists of cages formed by conductors, each connected to an end of a winding layer by flat conductor grids placed above the layers of winding, and each connected to the end of the layer of wire.

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**3,656,078**

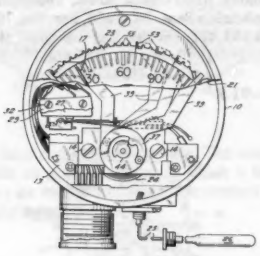
**TEMPERATURE RESPONSIVE CIRCUIT CONTROL INSTRUMENT**

**Italo Di Domenico, Pittsford, N.Y., assignor to Qualitrol Corporation, Fairport, N.Y.**

**Filed Nov. 3, 1970, Ser. No. 86,404**
**Int. Cl. H01h 71/16**
**U.S. Cl. 337—70** **9 Claims**

An electrical circuit control instrument having a control shaft operable by a thermal element responsive to temperature changes in an external medium. Arranged along one side of the interior of the casing is a bank of switches each of which has a fixed position and is connected in a separate control circuit. A cam individual to each switch and carried by the shaft is cooperable with tripping mechanism to trip its switch. Each cam is initially adjustable angularly on the shaft

to determine its precise moment of cooperation with the tripping mechanism. Subsequent adjustments as to the moment of cam and tripping mechanism cooperation are made by a manipulative lever carrying the tripping mechanism so as to vary the position of the latter relative to its cam. Each lever is curved so as to curve over its related switch without



interference when being swung fully in one direction.

In a modified form, a manually releasable clutch is connected in the control shaft which, when released, permits turning of the control shaft and cams independently of the thermal element so as to obtain a test operation of the tripping mechanism.

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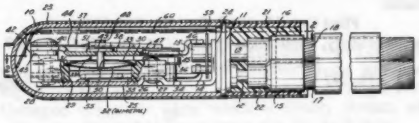
**3,656,079**

**THERMOSTATIC SWITCH**

**Paul R. Lee, Mansfield, Ohio, assignor to Essex International, Inc.**

**Filed Oct. 13, 1969, Ser. No. 865,793**
**Int. Cl. H01h** *61/04*
**U.S. Cl. 337—102** **7 Claims**



Thermostatic switch having a broad area, plate-like main heater between a bimetal member and a cantilever-mounted leaf spring mobile contact carrier. A dielectric block supports the mounted end of the mobile contact carrier and one end of the main heater, as well as the bimetal member. This block is mounted on a metal base plate which also supports a stationary contact for engagement by a mobile contact on the free end of the contact carrier. The foregoing abstract is merely a resume of one general application, is not a complete discussion of all principles of operation or applications, and is not to be construed as a limitation on the scope of the claimed subject matter.

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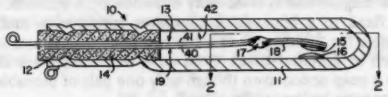
**3,656,080**

**THERMOSTAT OR THE LIKE HAVING TWISTED BIMETAL STRIP THEREIN**

**Alton R. Wells, 4573 West Trade Winds Avenue, Lauderdale-by-the-Sea, Fla.**

**Filed Apr. 29, 1970, Ser. No. 32,955**
**Int. Cl. H01h** *37/52, 61/01*
**U.S. Cl. 337—111** **9 Claims**

In this thermostat, thermal protector, or the like, a casing has at least one initially open end and a bimetal strip extends into the casing as a cantilever, being positioned thereby by insulation means securing the strip in position and sealing the initially open end of the casing. The strip has layers of different metals on the top and bottom surfaces thereof, and the strip has about a 180° twist therein intermediate the secured



portion and the free end portion thereof whereby improved cycling in the thermostat is obtained.

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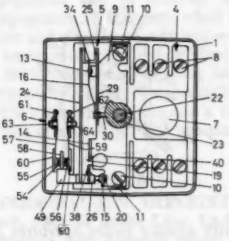
**3,656,081**

**ELECTRIC SWITCH WITH A SNAP-ACTION SYSTEM**

**Claus John, Horuphav, Denmark, assignor to Danfoss A/S, Nordborg, Denmark**

**Filed Jan. 15, 1970, Ser. No. 3,065**
**Claims priority, application Germany, Feb. 14, 1969, P 19 07 419.2**
**Int. Cl. H01h** *37/18, 37/52, 37/62*
**U.S. Cl. 337—346** **1 Claim**



A snap action thermostatic switch assembly of the type having a bimetal arm and an omega spring. The assembly has a fixed contact and a pair of resiliently mounted movable contacts on opposite sides of the fixed contact. The movable contacts have lugs and the bimetal arm has an actuating element which engages these lugs to move one contact or the other away from the fixed contact. The bimetal arm has a displacement range so that the actuating element thereof separates from the contact lug of a movable contact that is brought into engagement with the fixed contact. With this construction the tendency of a movable contact to rebound is minimized by reason of the mass associated with a movable contact being reduced the instant the movable contact touches the fixed contact.

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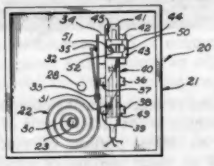
**3,656,082**

**POSITIONING DEVICE**

**Roland D. Beck, La Crescenta, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.**

**Filed Sept. 28, 1970, Ser. No. 75,924**
**Int. Cl. H01h** *1/66, 37/66, 37/68*
**U.S. Cl. 337—366** **10 Claims**



A thermostat for supplying natural gas to a gas fired furnace or the like at two different rates, depending upon the

difference between the temperature setting of the thermostat and the ambient temperature. The thermostatic switch has a ferromagnetic armature which is normally attracted by a fixed magnet and is selectively attracted by a movable magnet fixed to a bimetal. A cantilever spring wire makes it possible for the magnet to close two pairs of contacts in the switch at different times. Both pairs of contacts are closed with a snap action even though only one pair of movable ferromagnetic bodies are employed.

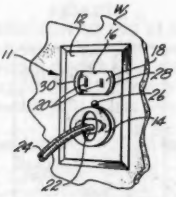
## ERRATA

For Classes 337—319 and 339—17 see:
Patent Nos. 3,656,182 and 3,656,183

## 3,656,083
## ELECTRICAL SAFETY DEVICE

Richard G. Brook, 4280 Kathy Avenue, Riverside, Calif.

Filed Sept. 1, 1970, Ser. No. 68,700
Int. Cl. H01r *13/54*
U.S. Cl. 339—39 4 Claims

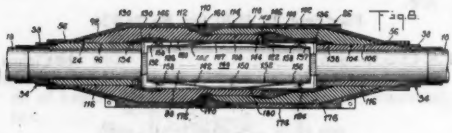


A faceplate with arcuate outlet apertures has oppositely directed flanges configured to the arcuate portions of the apertures. Safety guards having inturned projections are adapted to be engaged with the flanges for holding the guards in protective covering relation to the apertures. The guards are cup-shaped covers, each with a perforation permitting passage of an electrical cord and plug. The projections can be constituted by a resilient bead which snaps over the flanges, or a screw thread or a pair of lips engaged with the flanges by rotary movement.

## 3,656,084
## CONNECTOR CONSTRUCTION FOR HIGH VOLTAGE SHIELDED CABLES

Michael W. Malia, Washington, N.J., assignor to Amerace Esna Corporation, New York, N.Y.

Filed July 6, 1970, Ser. No. 52,425
Int. Cl. H01r *13/52*
U.S. Cl. 339—60 R 7 Claims

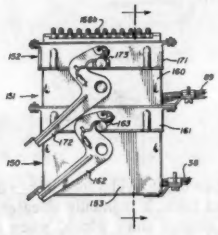


In an electrical connector having component parts capable of being assembled in the field, a pair of housing members each having an inner portion of electrically insulating elastomer and an outer portion of electrically conductive elastomer with a generally continuous and void-free juncture between the inner and outer portions, the junctures being routed around potential voids and following a continuous contour in the vicinity of the assembled ends of the housing members to avoid deleterious and concentrated electrical stresses in that vicinity.

## 3,656,085
## CONNECTOR FOR CONTROL CIRCUITS FOR A TAPE PERFORATOR

Morton J. Holiday, 8180 Ogden Street, Thornton, Colo.

Original application Sept. 20, 1968, Ser. No. 761,218, now Patent No. 3,595,471. Divided and this application Dec. 17, 1969, Ser. No. 885,668
Int. Cl. H01r *13/54*
U.S. Cl. 339—91 R 4 Claims

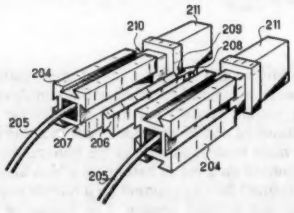


A connector for interconnecting corresponding leads of a plurality of branches of a multiple-lead network, such as found in the control systems of a multi-channel tape perforator. The connector comprises a plurality of plug and socket members with a branch of the multiple-lead network at each member.

## 3,656,086
## MODULAR ELECTRICAL CONNECTOR ASSEMBLY

Jean Debaigt, Maisons Laffitte, France, assignor to Compagnie Generale D'Entreprises Electriques, Levallois-Perret, France

Filed Oct. 15, 1969, Ser. No. 866,651
Claims priority, application France, Oct. 18, 1968, 170569
Int. Cl. H01p *13/64, 13/46*
U.S. Cl. 339—92 M 12 Claims



Modular lead-through connecting elements are assembled of strips or in a matrix and operate in conjunction with plug-in type connectors to prevent all connecting errors. The connectors can be locked in the operating position, and may comprise at least one reference marker for identification purposes.

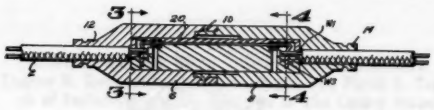
## 3,656,087
## DEVICE FOR CONNECTING AND PROTECTIVELY ENCLOSING SEPARATED LENGTHS OF ELECTRICAL CONDUCTOR CABLE

James M. Nutton, 269 Barker Street, North Andover, Mass.

Filed Mar. 21, 1969, Ser. No. 809,092
Int. Cl. H01r *7/28*
U.S. Cl. 339—95 5 Claims

Outer tubular casing sections are detachably secured together to protectively enclose a cable connector block in

which separated ends of electrical conductor cable may be releasably engaged and held in electrically connected relationship. Displaceable contact elements are yieldably mounted in the connector block in a position to engage and



lock around bare conductor wire ends. The connector block is formed with an aperture through which a lock actuating accessory may be inserted to move the contact elements out of a wire engaging position.

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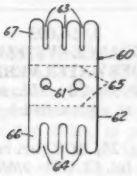
**3,656,088**

## CONNECTOR

**William J. Seim, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Filed July 27, 1970, Ser. No. 58,248**
**Int. Cl. H01r** *9/08*
**U.S. Cl. 339—98** **4 Claims**



Connector for small insulated aluminum wires comprises a wire-receiving insulating body member having wire-anchoring ridges and an insulating cap member carrying a resilient U-shaped connector plate which is doubly slotted, with a wide outer slot and a narrow inner slot, for each wire.

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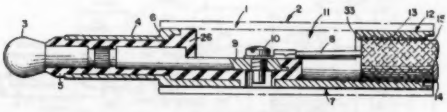
**3,656,089**

## ELECTRICAL PLUG

**James R. Bailey, Chicago, Ill., assignor to Switchcraft, Inc., Chicago, Ill.**

**Filed June 3, 1970, Ser. No. 43,021**
**Int. Cl. H01r** *17/18, 13/62*
**U.S. Cl. 339—110 C** **6 Claims**



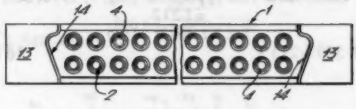
An electrical plug useful as a telephone plug and for other purposes is constructed with a removable handle which is interlocked with the plug body and can be removed to expose one or more terminals within the plug merely by rotating the handle a partial turn in one direction and pulling the two members apart axially. The handle and plug body can then be reassembled and interlocked by rotating the handle a partial turn in the opposite direction. Assembly screws are thereby eliminated.

**3,656,090**

## TWO-PART ELECTRICAL COUPLING

**Thomas Victor McDonald, Cheltenham, and Kenneth McDonald Stockley, Bath, both of England, assignors to Smiths Industries Limited, London, England**

**Filed May 19, 1970, Ser. No. 38,664**
**Claims priority, application Great Britain, Apr. 23, 1969, 26,336/69**
**Int. Cl. H01r** *13/64*
**U.S. Cl. 339—186 M** **10 Claims**



A two-part electrical coupling has a plurality of electrical connectors on one part for electrically engaging respective electrical connectors of the other part. The parts are provided with mating keys and keyways for ensuring that the electrical engagement can be effected only following a mechanical engagement of the parts when in one predetermined alignment and orientation with respect to one another. The keys and keyways are disposed on respective parts of the coupling and the keys are slidable along respective keyways as the two parts are urged together to establish the electrical engagement. Each key and keyway has a transverse section that is in the form of a sawtooth with unequal flanks.

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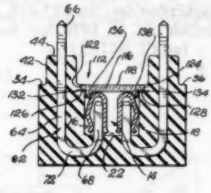
**3,656,091**

## TERMINAL JUNCTION SYSTEM

**John W. Anhalt, 5046 El Adobe Lane, La Crescenta, Calif.; James W. Maston, 686 Alameda Street, Altadena, Calif., and Gerald J. Selvin, 4433 Portico Place, Encino, Calif.**

**Filed Aug. 31, 1970, Ser. No. 68,238**
**Int. Cl. H01r** *31/08, 9/00*
**U.S. Cl. 339—198 R** **5 Claims**



A terminal junction system is formed of an insulated housing member having a central channel extending along its axial length. A plurality of rows of contact terminals extend along the axis of the housing member, one end of the contact terminals extending into the channel. A bussing spring which comprises a pair of side walls interconnected by an end wall is mounted in the channel and is contiguous with at least a pair of the contact terminals. The distance between the side walls of the bussing spring is such that when the spring is inserted in the channel between rows of contact terminals the side walls are contiguous with at least two adjacent contacts of each row. Moreover, the bussing spring may be utilized to interconnect a plurality of contact terminals of the same row. The other ends of the contact terminals can be coupled through one of the walls of the insulated housing member. Further, means may be formed on the insulating housing member so that when an external contact member is secured to one of the contact terminals an environmental seal may be provided at the junction of the contact terminal of the terminal junction and the external contact member. Visible

sealing means may be provided to cover said channel and simultaneously observe interconnection between adjacent contacts formed in the channel.

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**3,656,092**

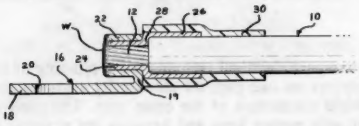
## TERMINAL DEVICE FOR WELDED TERMINATION OF ELECTRICAL LEADS

**Robert Charles Swengel, Sr., Hellam, and Timothy Allen Lemke, Camp Hill, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.**

**Continuation of application Ser. No. 720,775, Apr. 12, 1968, now abandoned. This application Aug. 7, 1970, Ser. No. 62,212**

**Int. Cl. H01r *11/06***

**U.S. Cl. 339—213 T** **18 Claims**




A terminal is disclosed which includes an inner sleeve portion adapted to receive a conductive lead inserted therein and an outer sleeve portion surrounding the inner sleeve portion with the sleeves arranged, relative to parts of the device which connect to other terminals, to permit a welding operation providing a weld of improved characteristics. In one embodiment for use in terminating aluminum wire the inner sleeve is made of aluminum and the outer sleeve is made of a different material such as a copper base metal alloy to provide a connection of dissimilar materials. A heat sensitive insulating sleeve is used to provide a seal of conductive interface and wire support, the sleeve being actuated by the heat of welding transferred through terminal sleeve portions.

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**3,656,093**

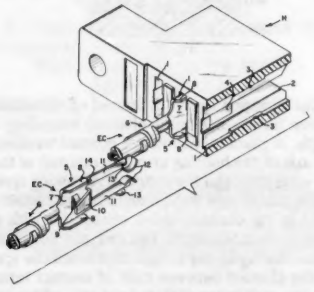
## ELECTRICAL CONNECTORS

**Robert John Kinkaid, New Cumberland, Pa., assignor to AMP Incorporated, Harrisburg, Pa.**

**Continuation of application Ser. No. 653,419, July 14, 1967. This application Jan. 12, 1970, Ser. No. 1,966**

**Int. Cl. H01r *13/12***

**U.S. Cl. 339—217 S** **3 Claims**



An electrical connector comprises a body section provided with cantilever leg members extending outwardly from one side and in the same plane thereof, the free ends of the leg members having inturned and arcuate-shaped sections defining contacts for electrical engagement with conductive paths of a PC board. The leg members converge toward each other and they are provided with stabilizing lugs to maintain the contacts in position in their passageways of a dielectric housing.

**3,656,094**

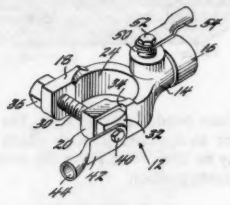
## ELECTRICAL CONNECTOR AND METHOD OF MAKING SAME

**Clarence B. Haegert, 1211 Elm Street, Coffeyville, Kans.**

**Filed Feb. 27, 1970, Ser. No. 15,267**

**Int. Cl. C22c *17/00*; H01r *11/26***

**U.S. Cl. 339—230 C** **4 Claims**




An electrical connector includes a body means having means for securing an electrical member thereto. The body means is formed of a zinc base alloy comprising aluminum, copper, cadmium, tin, lead, magnesium, iron and zinc within certain critical ranges. The zinc alloy is heated to a molten state and the molten alloy is then pressure or gravity molded, subjected to fast chilling and chemically threated to form an electrical connector free from corrosion.

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**3,656,095**

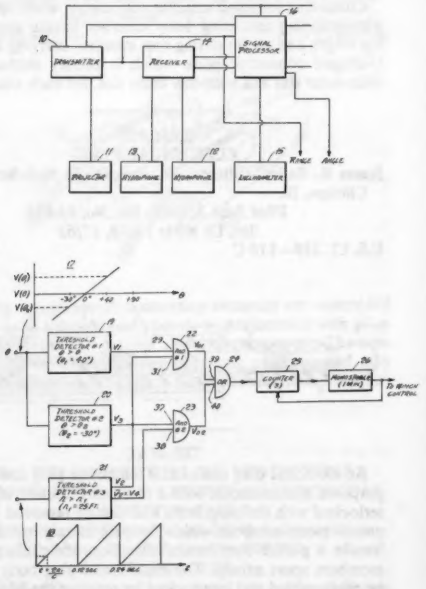
## TERRAIN AVOIDANCE SYSTEM FOR A TOWED UNDERWATER VEHICLE

**Richard R. Cavey, Ellicott City, Md., assignor to The United States of America as represented by the Secretary of the Navy**

**Filed Aug. 25, 1970, Ser. No. 66,721**

**Int. Cl. G01s *9/68***

**U.S. Cl. 340—3 R** **7 Claims**




A terrain avoidance system to provide a towed underwater vehicle with the ability to avoid those terrain features which

constitute a danger, yet permit the vehicle to navigate and search irregular terrain. This capability is provided employing the information obtained by an obstacle detection sonar subsystem; sonar information is so processed that the altitude control winch system for the vehicle is overridden when a terrain feature is classified as a potentially dangerous obstacle.

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**3,656,096**

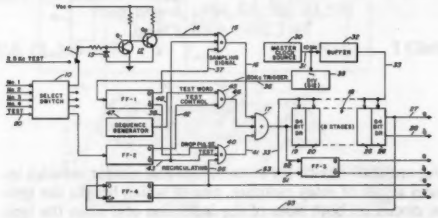
**DIGITAL DELAY TIME COMPRESSION CIRCUIT**

**Eugene R. Roeschlein; Donald C. Weiss, and David L. Zeph, all of Indianapolis, Ind., assignors to The United States of America as represented by the Secretary of the Navy**

**Filed May 7, 1970, Ser. No. 35,377**

**Int. Cl. G01r *23/00***

**U.S. Cl. 340—5 R** **5 Claims**



A digital delay time compression circuit (DELTIC) having a shift register to produce a 512 bit delay with an input from an AND-OR gating circuit to sample hydrophone data and recirculate this data in the shift register, or optionally through a one-bit flip-flop delay, to produce delayed and compressed digital words of 512 or 513 bits on an output thereof for correlation with other hydrophone data, and enabling and blocking pulse means applied to the AND-OR gating circuits to pass test words to periodically test the DELTIC for proper operation.

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**3,656,097**

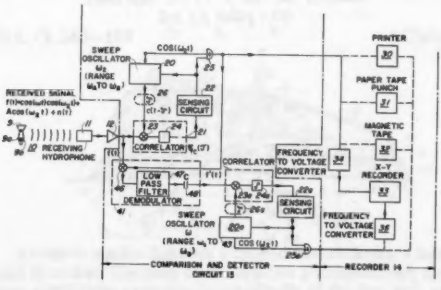
**SIGNAL PROCESSING SYSTEM FOR EXTRACTING A PERIODIC SIGNAL OF UNKNOWN FREQUENCY FROM A HIGH LEVEL BACKGROUND NOISE**

**Donald P. Massa, Cohasset, Mass., assignor to Massa Division Dynamics Corporation of America, Hingham, Mass.**

**Filed Dec. 29, 1969, Ser. No. 888,451**

**Int. Cl. G01r *23/14;* H04b *11/00***

**U.S. Cl. 340—5 R** **16 Claims**




A detector identifies the frequency of a periodic signal buried beneath the threshold of background noise. A correlator compares the frequency of the output of a sweep generator with the incoming signal. When the correlator indicates that the frequency of the sweep generator output coincides with that of the periodic signal, a recording is made of the sweep generator output.

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**3,656,098**

**GUIDE LOCK FOR MOTOR VEHICLES**

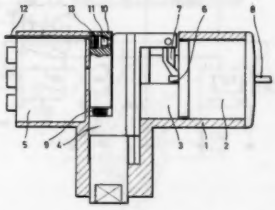
**Rainer Duren, and Klaus Neidig, both of Wolfsburg, Germany, assignors to Volkswagenwerk Akt.**

**Filed Oct. 17, 1969, Ser. No. 867,300**

**Claims priority, application Germany, Oct. 19, 1968, P 18 04 142.4**

**Int. Cl. G08b *21/00***

**U.S. Cl. 340—52 D** **2 Claims**



A steering column lock for motor vehicles with a warning device operative whenever the door of the vehicle is opened upon the key having been failed to be pulled out.

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**3,656,099**

**METHOD OF AND MEANS FOR CONTROLLING TRAFFIC**

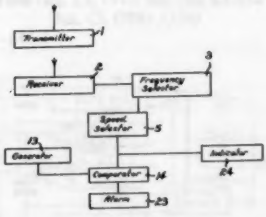
**Paul R. Campbell, 181 Halifax Street, Adelaide, South Australia, Australia (5000)**

**Filed Dec. 5, 1969, Ser. No. 882,459**

**Claims priority, application Australia, Dec. 8, 1968, 47420/68**

**Int. Cl. B60q *1/00***

**U.S. Cl. 340—62** **7 Claims**

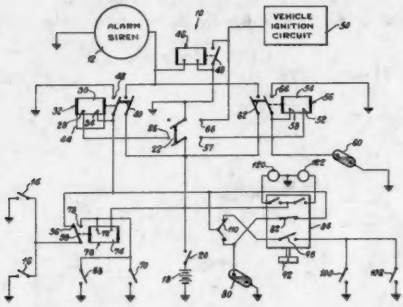



Method of indicating to the driver of a vehicle whether he is exceeding a speed limit as he passes through various areas, the vehicle containing a generator which produces a frequency of voltage in proportion to the vehicle speed and including means which can either be set by the operator or which are set by a radio signal or the like at the area concerned, the device including a comparator which actuates an alarm if the actual speed is outside of the limit set, whether the speed is below or above the set limit.

## 3,656,100
## ANTI-HIJACKING VEHICULAR ALARM SYSTEM

Joseph P. Beltrami, Garfield, N.J., assignor to Itad Alarm Systems, Inc., Garfield, N.J.

Filed May 8, 1970, Ser. No. 35,606
Int. Cl. B60r *25/10*
U.S. Cl. 340—63 15 Claims

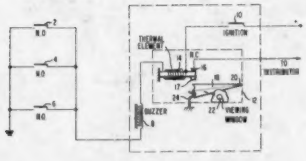



In an anti-hijacking vehicular alarm system in which an alarm is to be actuated upon unauthorized opening of a door of a vehicle, alarm circuit means for actuating the alarm in response to the opening of a vehicle door, operator means for selectively activating or deactivating the alarm circuit means, timer means capable of being actuated to operate for a selected interval of time, means for precluding operation of the operator means during the selected interval of time without actuation of the alarm, and means for precluding alteration of the duration of the selected interval of time during that interval without actuation of the alarm.

## 3,656,101
## ENGINE SHUT-OFF CONTROL SYSTEM WITH TIMER BUZZER TELL-TALE PACKAGE

Lloyd T. Akeley, Fullerton, Calif., assignor to Simmonds Precision Products, Inc., Tarrytown, N.Y.

Filed Apr. 10, 1969, Ser. No. 815,151
Int. Cl. B60b *3/04*
U.S. Cl. 340—53 5 Claims

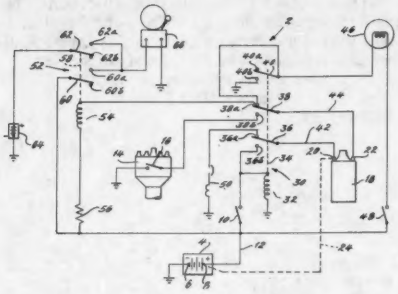


An engine shut-off control system utilizing a timer-buzzer package in which a plurality of detector switches are connected in circuit with a buzzer for signaling the operator whenever one of the switches is closed in response to detection of an abnormal operating condition of the engine. A thermal timer is connected in series with the buzzer and opens an associated switch after a given amount of time has elapsed to interrupt the current to the distributor of the engine.

## 3,656,102
## VEHICULAR ANTITHEFT DEVICE HAVING RELAY SWITCHES FOR INTERRUPTING INDUCTION COIL CIRCUIT AND FOR ACTIVATING AN ALARM

David A. Hale, 5222 Dowler Avenue, Pine Lawn, Mo., and Earl R. Housman, 5814 Dressell Avenue, St. Louis, Mo.

Filed June 1, 1970, Ser. No. 42,235
Int. Cl. B60r *25/04*
U.S. Cl. 340—64 8 Claims

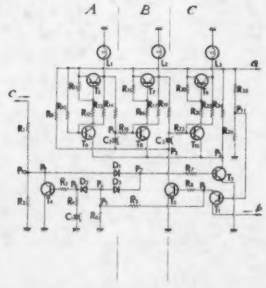


An antitheft device for automobiles and similar vehicles includes a pair of relay switches, one of which breaks the ignition circuit on both sides of the induction coil when the ignition switch is open. The other relay switch connects the battery with an alarm device whenever the circuit to the induction coil is disrupted either by severing the wires leading to the coil or by placing the coil at the same potential as the battery. The other relay switch also connects the alarm with an auxiliary battery whenever the automobile battery is disconnected from the ignition system. Thus, the antitheft device signals an alarm and renders the ignition system inoperative whenever a thief attempts to run a jumper wire from the battery to the induction coil. It also signals an alarm whenever the thief attempts to remove the battery.

## 3,656,103
## VEHICLE'S DIRECTION INDICATING LAMP AND BRAKE LAMP FOR COMBINATION USE

Hiroshi Tanaka, Motosu-gun; Shozo Naito, Ama-gun, and Tetsuji Shimizu, Nagoya, all of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Nishibiwajima-cho, Nishikasugai-gun, Aichi-Perfecture, Japan

Filed Mar. 18, 1969, Ser. No. 808,235
Int. Cl. B60q *1/38*
U.S. Cl. 340—67 9 Claims




A signalling system for an automobile operates a plurality of lamps on the rear of a vehicle either simultaneously or sequentially. It responds to a brake signal appearing on one

line and a direction signal appearing on another line. The system is composed of a plurality of bistable circuits each connected to one lamp and receiving its input signal from the adjacent bistable circuit. The brake signal turns on the first bistable circuit which immediately turns on the others in sequence. Thus the lamps are lit simultaneously. The direction indicating signal turns on the first bistable circuit to light the first lamp but also incorporates a time delay into the couplings between the adjacent bistable circuits. Thus the lamps are turned on sequentially. The indicator signal also turns on a transistor that cuts off any brake signal that may occur during a direction indicating signal.

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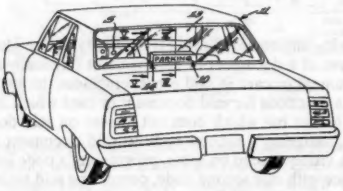
**3,656,104**

## ADVANCE ANTI-LOCKOUT VEHICLE PARKING SIGNAL HAVING ADJUSTABLE DECK MOUNTED BRACKETS

**Herb G. Samra, 1606 North 74th Court, Elmwood Park, Ill.**

**Filed June 4, 1970, Ser. No. 43,370**
**Int. Cl. B60q *1/00, 1/46***
**U.S. Cl. 340—95** **1 Claim**




A visual signal device for vehicles effectively providing an advance clear warning, which cannot be misinterpreted, of intent to take a position in traffic for parking the vehicle so that following vehicles or pedestrians may maneuver in advance to prevent a traffic jam or avoid injury. The device produces a flashing conspicuous parking message which is manually controlled and not interrupted by any automatic mechanisms on the vehicle. A preferred form of the device is easily mounted on the rear shelf or deck of a vehicle at a selected height and distance from the rear window of the vehicle so as to provide an unobstructed rear view and so as to be clearly visible through the window from the rear of the vehicle. A feature includes a tiltable adjustment for the device so as to beam the signal at the most effective angle.

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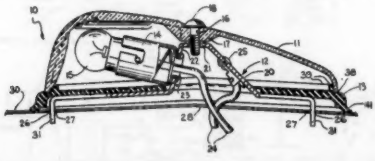
**3,656,105**

## VEHICLE MARKER LIGHT HAVING METAL STRAP EXTENDING INTO CUPPED LENS

**Ernest R. Steltzer, Lysander, and Edward J. Nitsch, Camillus, both of N.Y., assignors to R. E. Dietz Co., Syracuse, N.Y.**

**Filed Apr. 29, 1971, Ser. No. 138,464**
**Int. Cl. B60q *1/00***
**U.S. Cl. 340—119** **4 Claims**



A vehicle marker light has a cupped lens enclosing a lamp and its socket. The lamp base comprises a comparatively narrow metal strap extending longitudinally of the lens and, except for its outwardly bent ends, lying within the lens. At its center the strap is bent inward of the lens, then bent longitudinally along the inner surface of the top of the lens, then bent outwardly of the lens, and then longitudinally again, the outwardly bent portion being apertured for securement of the socket thereto and the longitudinally extending portion along the top of the lens being apertured and threaded for reception of a screw passing through the top of the lens. The outwardly bent ends of the strap have spring biased detent ends for quick installation in holes in a sheet metal portion of the vehicle body. A resilient pad between the lens and strap has a perimetrical resilient skirt for sealed engagement with the vehicle body.

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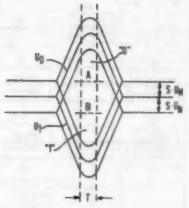
**3,656,106**

## EVALUATION CIRCUIT FOR THE DETERMINATION OF INFORMATION SENSED FROM MATRIX MEMORIES

**Karl-Ulrich Stein, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany**

**Filed May 25, 1970, Ser. No. 41,144**
**Claims priority, application Germany, June 9, 1969, P 19 29 142.0**
**Int. Cl. H03k *5/18*; G06k *5/00***
**U.S. Cl. 340—146.1** **2 Claims**




A circuit for evaluating the correctness of information content of signals sensed from a mass storage memory, such as a magnetic core or a magnetic thin film memory. A pair of threshold circuits, each having a different threshold, receive the sensed signal and a reading strobe-type signal, generally desired of the same magnitude of the sensed signal, and provide valid or fault indicating signals to a coupling circuit having a pair of output terminals, one of which is enabled to indicate information content and the other of which is enabled when the information content is in question.

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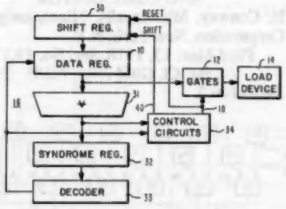
**3,656,107**

## AUTOMATIC DOUBLE ERROR DETECTION AND CORRECTION APPARATUS

**Mu-Yue Hsiao, and Wadie F. Mikhail, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Oct. 23, 1970, Ser. No. 83,334**
**Int. Cl. G08c *25/00***
**U.S. Cl. 340—146.1** **10 Claims**




A method and apparatus are provided for detecting and correcting double errors automatically by generating syndrome S bits from a binary word having check bits and data bits. The syndrome S bits themselves are decoded to locate and correct single errors. Wen double errors occur in the binary word, the syndrome S bits automatically operate a switching device which changes the bits of the binary word one at a time to correct one of the double errors. If one of the double errors is not corrected when a given bit is

changed, this is indicated by the syndrome S bits, and the bit under test is restored as the next bit of the binary word is changed or complemented. Whenever one of the double errors is corrected by the switching device, the syndrome bits then indicate the location of the remaining single error, and the syndrome S bits are decoded to correct the second one of the double errors.

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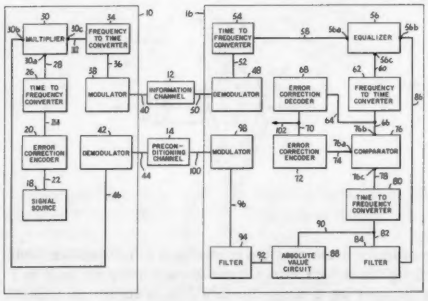
### 3,656,108
### SIGNAL PRECONDITIONING METHOD AND TRANSMISSION SYSTEM

**Timothy Arbuckle, Montclair, and Herbert Sullivan, Fort Lee, both of N.J., assignors to Computer Modem Corporation, Fort Lee, N.J.**

**Filed June 9, 1969, Ser. No. 831,669**
**Int. Cl. G08c** *25/00*
**U.S. Cl. 340—146.1** **10 Claims**




A system for intelligible exchange of signals through noise-affected communication channels. Apparatus is provided in a transmitting station for preconditioning signals intended to be transmitted over a telephone line or like channel to a remote receiving station. The preconditioning apparatus is operative to modify characteristics of said signals in accordance with further signals generated at the receiving station and indicative of channel transmission characteristics, the preconditioning resulting in a uniform distribution or spreading of channel spike noise throughout received signals. Noise uniformity in received signals permits ready determination of the said signals intended to be transmitted. A method of preconditioning digital data signals for such exchange is particularly set forth.

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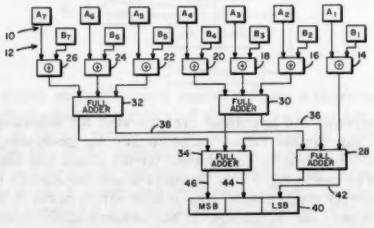
### 3,656,109
### HAMMING DISTANCE AND MAGNITUDE DETECTOR AND COMPARATOR

**Patrick H. Conway, Minneapolis, Minn., assignor to Sperry Rand Corporation, New York, N.Y.**

**Filed Mar. 13, 1970, Ser. No. 19,176**
**Int. Cl. G06f** *7/02, 7/385*
**U.S. Cl. 340—146.2** **4 Claims**




The specification describes the design for a Hamming distance and magnitude detector as well as a Hamming magnitude comparator, each implemented with conventional boolean logic devices operating in a parallel manner.

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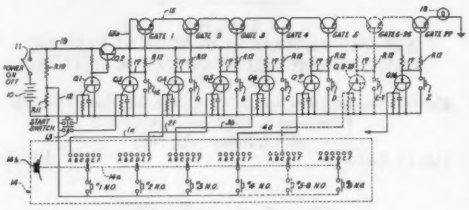
### 3,656,110
### CREDIT CARD ASSOCIATED APPARATUS FOR PERSONNEL IDENTIFICATION

**Charles V. Crane, Olathe, Kans., assignor to C & S Security Devices Inc., Olathe, Kans.**

**Filed Nov. 20, 1969, Ser. No. 878,445**
**Int. Cl. H04q** *5/16;* **G06k** *7/06*
**U.S. Cl. 340—149** **4 Claims**




A device-implemented process for verifying the identity of the bearer of a document or card without physically utilizing the document or card in said process includes the steps of assigning a first code for said document or card which is known to said bearer but which does not appear on said document or card, assigning a second code to said document or card which is visibly placed on same, programing a code interpreting device with said second code, comparing said second programed code with said first code by utilizing said device, and indicating by said device when said first code corresponds to said second code as a result of a comparing step, said corresponding of codes thereby identifying the bearer of the document or card.

The device includes an encoding and a decoding section. The encoding section permits the device to be programed in accordance with the second code which visibly appears on the card or document by manually operating a rotary switch and selectable push buttons.

The decoding section is operated by the manipulation of a second set of push buttons in order to enter the first code in the device. The device electronically compares the decoding first code with the encoded second code so that when the two codes correspond a visual indication is registered and the bearer of the document is sufficiently identified.

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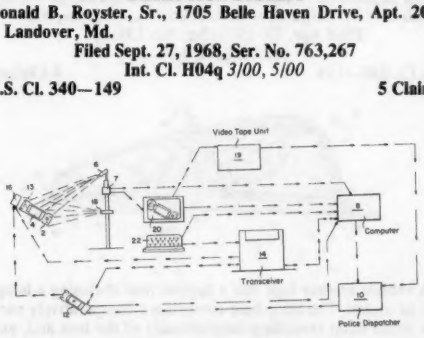
### 3,656,111
### COMPUTER CONTROLLED STOLEN VEHICLE DETECTION SYSTEM

**Ronald B. Royster, Sr., 1705 Belle Haven Drive, Apt. 203, Landover, Md.**

**Filed Sept. 27, 1968, Ser. No. 763,267**
**Int. Cl. H04q** *3/00, 5/00*
**U.S. Cl. 340—149** **5 Claims**




A method for detecting stolen or other wanted vehicles which comprises positioning the detecting means at a plurality of locations for detecting vehicles which have been specifically marked for selective individual identification, and

providing transmitting means at each of the locations for transmission of detected vehicular information to a central computer. Each of the detecting means and transmitting means is operated simultaneously with the computer which stores stolen vehicle information, and compares the stored information with the detected vehicular information transmitted from the transmitting means to the computer. After the information is compared, a signal is transmitted corresponding to the stolen vehicle information to immobilize the stolen vehicle near the detecting means.

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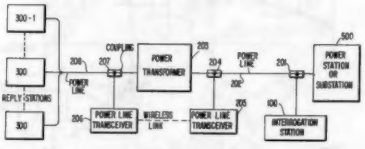
### 3,656,112
### UTILITY METER REMOTE AUTOMATIC READING SYSTEM

**Stephen Paull, Falls Church, Va., assignor to Constellation Science and Technology Corporation, Oxon Hill, Md.**

**Filed Mar. 14, 1969, Ser. No. 807,339**
**Int. Cl. H04q *9/02***
**U.S. Cl. 340—151** **32 Claims**




A digital data processing and communications system for a remote utility meter data acquisition system is disclosed. The system employs an electronic interrogator which may be either mobile or fixed. The interrogator transmits an encoded interrogation message to a designated fixed reply station associated with a utility meter. Upon receipt of a properly authenticated interrogation, the reply station transmits the utility meter reading back to the interrogator. The system is so designed that when more than one reply station is within range of the interrogation message, only the one reply station that is addressed in the interrogation message will transmit a reply. Thus, an interrogating operation may be carried out in which many reply stations are interrogated in successive order, with each station transmitting its reply in turn. Transmission between the interrogation station and the various reply stations may be via radio link, acoustic link, electric power line, or a combination thereof.

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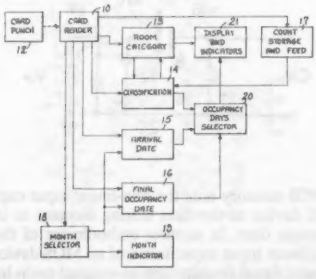
### 3,656,113
### CONTROL SYSTEM FOR ROOM RESERVATION

**William G. Lince, Yarmouth Port, Mass., assignor to UMC Electronics Company, North Haven, Conn.**

**Filed Nov. 1, 1968, Ser. No. 772,673**
**Int. Cl. H04g *3/00***
**U.S. Cl. 340—153** **18 Claims**




This disclosure relates to a system which displays the availability of categories of items over a predetermined number of units of time. Provision is made to constantly update the display by incrementing or decrementing the appropriate item categories between initial and final dates of use of any item. The units of time may be classified into groups to allow an expired group of units of time to be annexed to the last group of units of time to continuously utilize the system over a predetermined future time period.

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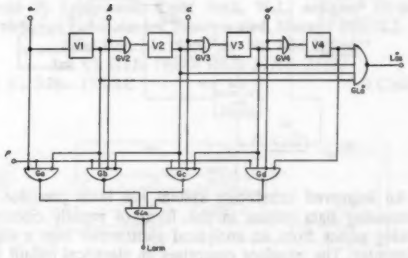
### 3,656,114
### ELECTRONIC LOCK ARRANGEMENT HAVING PARALLEL CODED INPUT

**Tore Gottfrid Hesselgren, Borensvagen 1, Johanneshov, Sweden**

**Filed May 1, 1969, Ser. No. 820,921**
**Claims priority, application Sweden, May 7, 1968, 6113/68**
**Int. Cl. H04g *3/02***
**U.S. Cl. 340—164** **3 Claims**




An electronic lock arrangement is disclosed, the arrangement comprising a plurality of consecutively disposed code step circuits. Each circuit, when actuated by an input code pulse train, generates a parallel output, which outputs define a lock release output signal when the input code pulse train is received in proper predetermined order.

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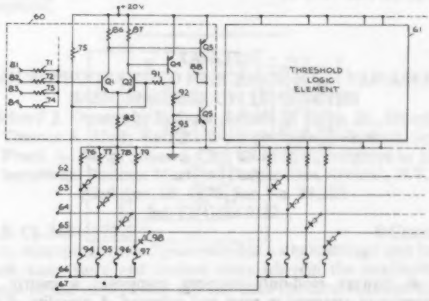
### 3,656,115
### FUSIBLE LINK MATRIX FOR PROGRAMMABLE NETWORKS

**Roy P. Foerster, Thousand Oaks, Calif., assignor to The Bunker-Ramo Corporation, Canoga Park, Calif.**

**Continuation of application Ser. No. 728,684, May 13, 1968, now abandoned. This application Apr. 19, 1971, Ser. No. 135,356**
**Int. Cl. H04q *9/00***
**U.S. Cl. 340—166 R** **3 Claims**




A fusible link matrix is provided to enable a parameter (e.g., resistance) of a module to be adjusted, without requiring physical access to the components thereof, by selectively

fusing (opening or closing) links of the matrix through an addressing bus. Decoupling diodes between the fusible links and lines of the bus prevent sneak current paths.

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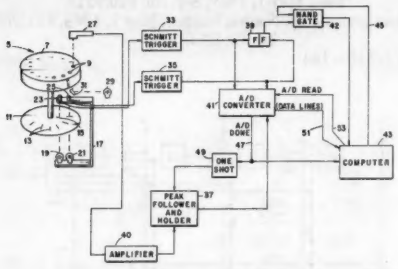
## 3,656,116
## COMPUTER INTERFACE

**James M. Jansen, Jr., Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Atomic Energy Commission**

**Filed May 5, 1970, Ser. No. 34,783**
**Int. Cl. G06f *3/05*; G05b *21/00***
**U.S. Cl. 340—172.5** **2 Claims**




An improved interfacing system has been provided for processing data values in the form of rapidly occurring analog pulses from an analytical photometer into a digital computer. The interface comprises an electrical circuit having a data sample-and-hold section that provides data values to an analog-to-digital converter for reading into the computer. A gating circuit is provided which, when enabled by the computer, allows the computer to sense the first of a series of data pulses to provide an address signal into the computer for addressing the following series of pulses in the computer memory taken from the analog-to-digital converter. The computer may communicate with several interfaced photometers by means of programs held in storage whereby the data values are automatically processed according to the analyses being performed by the photometers.

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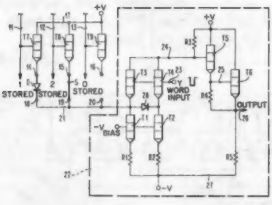
## 3,656,117
## TERNARY READ-ONLY MEMORY

**Gerald A. Maley, Fishkill, and James L. Walsh, Hyde Park, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Feb. 5, 1971, Ser. No. 112,934**
**Int. Cl. G11c *17/00*, *11/40***
**U.S. Cl. 340—173 SP** **16 Claims**




A ternary read-only memory comprises a matrix of transistors arranged in rows and columns. A plurality of bit lines are each connected to the transistors of a respective one of the columns. Connected to the emitter of each transistor is an impedance which may be either a diode, a conductive shunt or an open circuit. A word amplifier is connected to each row of transistors. Means are provided for energizing one of the bit lines and one of the word amplifiers so as to select one transistor for reading out. Each word amplifier includes means for generating a ternary logic function depending upon the value of the impedance connected to the emitter of the transistor selected by energization of the respective bit line and word amplifiers.

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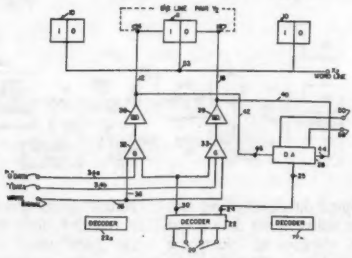
## 3,656,118
## READ/WRITE SYSTEM AND CIRCUIT FOR SEMICONDUCTOR MEMORIES

**Richard W. Bryant, Poughkeepsie, and George K. Tu, Wappingers Falls, both of N.Y., assignors to Cogar Corporation, Wappingers Falls, N.Y.**

**Filed May 1, 1970, Ser. No. 33,554**
**Int. Cl. H03r *19/08*; G11c *11/00***
**U.S. Cl. 340—173 FF** **24 Claims**




This disclosure relates to a system and semiconductor circuit for reading out of and writing into selected storage cells of a semiconductor memory. In particular, the disclosure relates to such a system and circuit wherein a group of cells utilizes a single decoder for both the read and write operations. The use of a single decoder for a group of cells is accomplished by utilizing both the in-phase and out-of-phase outputs of each decoder to minimize the number of logic stages required.

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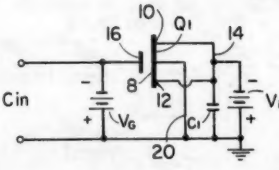
## 3,656,119
## MEMORY UTILIZING THE NON-LINEAR INPUT CAPACITANCE OF AN MOS DEVICE

**Lamar T. Baker, West Islip, N.Y., assignor to General Instrument Corporation, Newark, N.J.**

**Filed Apr. 24, 1970, Ser. No. 31,490**
**Int. Cl. G11c *11/40*, *5/02***
**U.S. Cl. 340—173 R** **27 Claims**




An MOS memory uses the non-linear input capacitance of an MOS device as the data storing element to increase the data storage time. In another embodiment of the invention the non-linear input capacitance of an MOS device is utilized to increase signal feedthrough to a signal node in a memory circuit. In a third embodiment of the invention, practical use is made of the usually undesirable parasitic PNP transistor action of an MOS circuit in a memory amplifier. Also dis-

closed is an improved two-device memory cell in which the principles of the invention are utilized.

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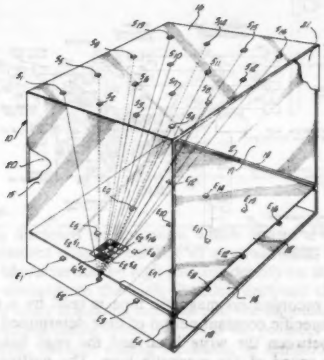
**3,656,120**
**READ ONLY MEMORY**

**Douglas R. Maure, Hamden, Conn., assignor to Optical Memory Systems Inc., Santa Ana, Calif.**

**Filed June 5, 1969, Ser. No. 830,594**
**Int. Cl. G11c** *13/04, 5/04*
**U.S. Cl. 340—173 LM** **14 Claims**



A read only memory wherein an array of light emitting elements and an array of light sensing elements are positioned on opposite sides of an optical mask is disclosed. The mask is selectively provided with bit value defining light transmissive and non-transmissive portions at the intersection points of the light transmission paths as defined by the arrays and the mask. Individual emitting array and sensing array components are selectively energized and sensed respectively to determine the bit values defined by the mask.

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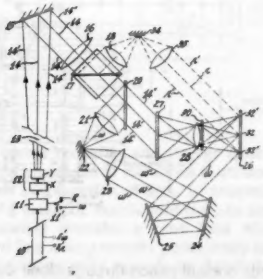
**3,656,121**
**ELECTRICALLY AND OPTICALLY ACCESSIBLE MEMORY**

**Jan Aleksander Rajchman, Princeton, and Walter Frank Kosonocky, Skillman, both of N.J., assignors to RCA Corporation**

**Filed Oct. 15, 1969, Ser. No. 866,564**
**Int. Cl. G11b** *7/00*
**U.S. Cl. 340—173 R** **5 Claims**



A computer memory system is disclosed which includes a randomly and electrically accessible semiconductor "page" memory. The semiconductor page memory is conventional to the extent that it includes a planar array of electrically-accessible flip-flops for storing a corresponding number of binary information bits. In addition, each flip-flop is provided with a photosensor by which the flip-flop can be set in response to received light, and is provided with a light valve controlled by the state of the flip-flop. A laser light source, a light deflector and holographic optics are provided to create a hologram of the array of light valves at any one of many small areas on an erasable holographic storage medium. Subsequently, the hologram can be illuminated to recreate and project the image of the array of light valves onto the array of photosensors to return the information to the flip-flops in the semiconductor page memory. In this way, the semiconductor page memory serves as a page-at-a-time electrical input-output unit for a great many pages of information stored optically on the erasable holographic storage medium.

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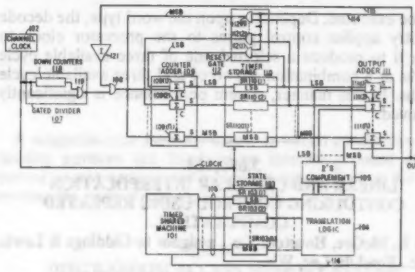
**3,656,122**
**TIME-SHARED SHIFT REGISTER COUNTER WITH COUNT MODIFIED EACH NTH RECIRCULATION**

**Gerald P. Pasternack, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Dec. 11, 1969, Ser. No. 884,252**
**Int. Cl. G11c** *19/00;* **H03k** *27/00, 23/02*
**U.S. Cl. 340—173 RC** **4 Claims**



Numbers representing time periods are stored in a plurality of shift registers, each register being associated with a digit of the stored number. Each shift register has a plurality of stages, equal in number to the number of time periods which are served by the counter. The number derived from the output of the shift register is recirculated to the input through an adder, the number count being thereby increased to correspond to elapsed time. The number count is increased, however, only during every *n*th recirculation to reduce the magnitude of the number which defines an elapsed time period thereby reducing the number of shift registers required.

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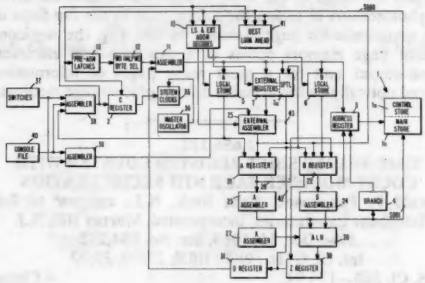
**3,656,123**
**MICROPROGRAMMED PROCESSOR WITH VARIABLE BASIC MACHINE CYCLE LENGTHS**

**Richard J. Carnevale, Endwell; Leland D. Howe, Jr., Owego; Thomas A. Metz; Karl K. Womack, both of Endicott, and Frank A. Zurla, Johnson City, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Apr. 16, 1970, Ser. No. 29,223**
**Int. Cl. G06f** *9/12*
**U.S. Cl. 340—172.5** **8 Claims**

A microprogrammed processor has a single storage unit for both main store and control store wherein the read/write times of the storage unit are less than the time required for the microprogram controlled hardware to execute a control word. Since there is no requirement for the hardware to wait for a next succeeding access to storage as in typical known processors, but rather the storage unit now waits for the hardware, it becomes feasible and practicable to improve the

performance of the processor significantly with little additional cost by providing basic machine cycle times for different control word executions which are maintained at a minimum. In the preferred embodiment, a decode circuit examines each control word after it is transferred from control store to a control register to determine the word type which



is to be executed. Depending upon the word type, the decode circuitry applies control pulses to the processor clock to cause ti to produce a selected one of three available cycle lengths or a combination of two of said three available cycle lengths. In this manner, system performance is significantly improved.

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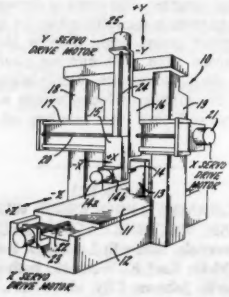
**3,656,124**

**LINEAR AND CIRCULAR INTERPOLATION CONTOURING CONTROL USING REPEATED COMPUTATION**

**John K. McGee, Houston, Tex., assignor to Giddings & Lewis, Inc., Fond du Lac, Wis.**

**Filed Sept. 26, 1968, Ser. No. 762,835**
**Int. Cl. G06f *15/46***
**U.S. Cl. 340—172.5** **82 Claims**



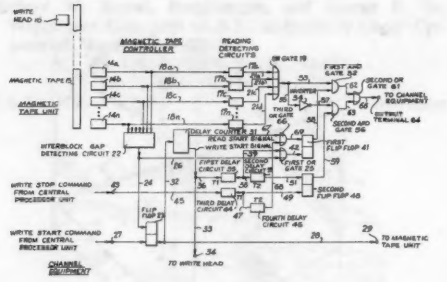
A numerical path control system including a time shared digital computer generating for each of a plurality of axes regularly recurring numerical excursion commands. A two axis system is shown to be capable of deriving from a small number of data words successive straight line path or circular arc path command signals at a rate of 50 times a second and of converting these into intermediate or secondary command signals which are applied to the servos of the machine axes at a rate of 500 times a second.

**3,656,125**

**WRITING CHECKING SYSTEM**

**Kaoru Kanda, Yokohama, and Tadahiro Kobayashi, Kawasaki, both of Japan, assignors to Fujitsu, Limited, Kawasaki, Japan**

**Filed Nov. 9, 1970, Ser. No. 87,882**
**Claims priority, application Japan, Nov. 20, 1969, 44/93133**
**Int. Cl. G11b *27/36, 5/46***
**U.S. Cl. 340—174.1 B** **5 Claims**



Data recorded on magnetic tape is read by a read head after a specific constant period of time determined by the interval between the write head and the read head and the transfer speed of the magnetic tape. The writing checking system determines whether or not the data written on the magnetic tape by the write head may be read by the read head after a specific predetermined period of time. There is a period of time between the writing of the data on the magnetic tape by the write head and the passage of the data under the read head. Such period of time is utilized to predetermine the time at which the data should not be read by the read head and the time at which the data should be read by the read head and to check whether or not the data read by the read head satisfies the predetermined condition, thereby enhancing the reliability of the writing.

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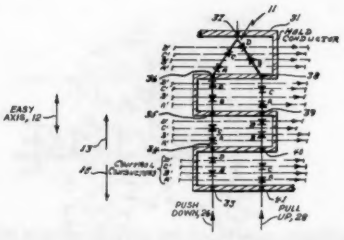
**3,656,126**

**BI-DIRECTIONAL SHIFT REGISTER**

**Harvey I. Jauvtis, Belmont, Mass., assignor to The United States of America as represented by the Secretary of the Air Force**

**Filed Dec. 31, 1969, Ser. No. 889,446**
**Int. Cl. G11c *21/00***
**U.S. Cl. 340—174 FB** **3 Claims**



A magnetic domain punch-through diode shift register having a pair of vertical low coercive channels in a region of high coercivity. Dispersed in the channels are punch-through magnetic domain diodes which alternate with opposing polarities. A domain can be propagated in only one direction by applying a conducting pulse to a chosen diode at the same

time as a drive pulse is applied. A folded hold conductor alternates its direction between every two diodes.

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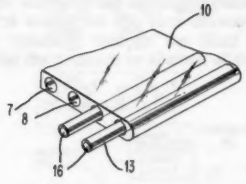
**3,656,127**
**MEMORY PLANE**
**Gilbert R. Reid, Norristown, Pa., assignor to Sperry Rand Corporation, New York, N.Y.**
Continuation of Ser. No. 426,050, Jan. 18, 1965
**Filed May 4, 1970, Ser. No. 60,541**
**Int. Cl. G11c** *11/04, 11/14*
**U.S. Cl. 340—174 PW** **6 Claims**




There is disclosed an apparatus which houses a delicate memory element which is the size of a human hair. The apparatus is characterized by high packing density on the order of 25–50 elements to the inch. Parallel, enclosed channels are formed in an insulating material and are dimensioned so that the magnetizable wires are held in position therein without being stressed during variations in temperature as well as for facile insertion and removal both during manufacturing and repair operations.

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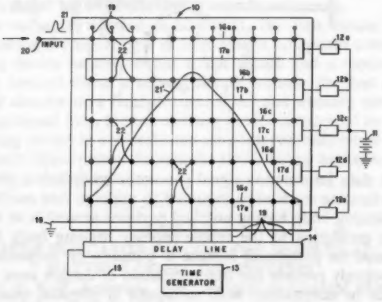
**3,656,128**
**MAGNETIC MATRIX RECORDING SYSTEM**
**Kristian Aaland, Livermore, Calif., assignor to The United States of America as represented by the United States Atomic Energy Commission**
**Filed Dec. 22, 1970, Ser. No. 100,740**
**Int. Cl. G11c** *27/00, 11/14, 5/02*
**U.S. Cl. 340—174 AN** **10 Claims**




A magnetic matrix recording and storage system in which an array of thin-film magnetic memories is utilized to record electrical signals as a function of time. In general, for example, one axis of a magnetic matrix card (i.e., an array of magnetic bit memories) provides a time base wherein each column or word line is sequentially periodically excited. The remaining axis concurrently records in threshold steps the magnitude of a signal, thereby providing a magnetically stored plot of the signal as a function of time. The magnetic matrix system may be used, for example, to provide the equivalent of an oscilloscope-camera combination for the recording of a time-varying signal, where the waveform of the signal is traced out as the boundary between regions of the two stable states of magnetization possible in the film. The magnetic matrix system may utilize, instead of cards or ribbons, parallel wires, each plated with a magnetic thin film and wrapped with coils of wire which provide the bias and signal fields. Readout of the magnetic matrix recording system may, for example, be accomplished by magneto-optical means or electronically.

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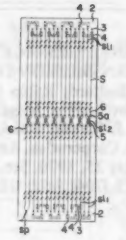
**3,656,129**
**MAGNETIC-CORE MEMORY MATRIX**
**Joichiro Ezaki, Funabashi-shi, Japan, assignor to TDK Electronics Company Ltd., Chiyoda-ku, Tokyo, Japan**
**Filed Aug. 26, 1969, Ser. No. 853,026**
**Claims priority, application Japan, Sept. 3, 1968, 43/76211**
**Int. Cl. G11c** *5/06, 11/06*
**U.S. Cl. 340—174 CR** **4 Claims**



A magnetic-core memory matrix in which conductive connecting portions are fixed to an insulating board at the curved or intersecting portions of the sense windings for connecting the ends of said sense windings.

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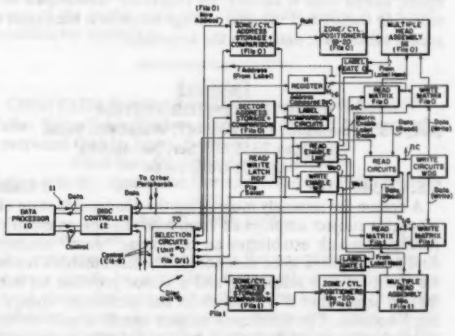
**3,656,130**
**DISC RANDOM ACCESS MEMORY SYSTEM**
**Edward P. Bucklin, Jr., Hawthorne; Pat E. Evans, Torrance, and Richard K. Gerlach, Rolling Hills Estates, all of Calif., assignors to The National Cash Register Company, Dayton, Ohio**
**Continuation of application Ser. No. 648,496, June 23, 1967, now abandoned. This application June 4, 1970, Ser. No. 41,766**
**Int. Cl. G11b** *21/08*
**U.S. Cl. 340—174.1 C** **13 Claims**




A control system is provided for random access to data storage areas comprising sectors of data tracks on the surfaces of rotating record discs of a group of disc storage units.

Each disc storage unit of this group comprises a pair of disc files including two interchangeable record disc stacks and a movable head assembly for each disc stack. In response to control information including an address supplied to the control system, the movable head assembly for the addressed storage unit and file is moved radially until the address, specifying the data track, compares identically to the prerecorded (label) track address read from the disc surface by a predetermined one of the read/write heads (label head) in the head assembly. The track addresses comprise a portion only of each of a group of label tracks which are read by said predetermined label head during radial movement of the head assembly and each of the label tracks includes sector addresses and control signals including clock pulses for writing data, synchronization signals for timing of operations including switching operations for selectively gating the signals read by the label head and data signals read by a selected one of the remaining read/write (data) heads of the head assembly to a single read amplifier of the control system.

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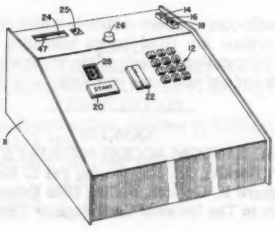
**3,656,131**
**DATA TERMINAL MESSAGE COMPILER AND TRANSMISSION SYSTEM**

**Richard L. Libby, Bedford; Robin C. Moseley; Thomas G. Jehl, both of Andover, all of Mass.; William A. Ruggirello, Derry, N.H., and J. Stewart Dunn, North Reading, Mass., assignors to DASA Corporation, Andover, Mass.**

**Filed May 25, 1970, Ser. No. 40,309**
**Int. Cl. G06f *3/02*; G11b *13/00***
**U.S. Cl. 340—172.5** **12 Claims**



A data terminal message compiler and transmission system in which data is selectively entered and stored on a suitable storage means, such as magnetic tape, by means of a manual entry keyboard. The stored data is visually verifiable and may be corrected at any time prior to transmission. Upon command, stored data is serially, by character, transmitted to a receiving station and the data storage medium is then reset to accept subsequent data from the keyboard.

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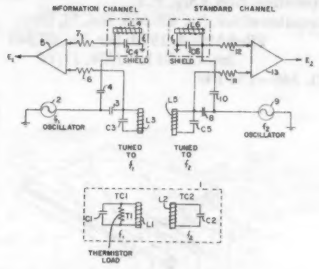
**3,656,132**
**REMOTE MONITOR SYSTEM**

**Joseph S. Brumbelow, P.O. Box 447, Wakefield, Mass.**

**Filed May 26, 1970, Ser. No. 40,488**
**Int. Cl. G08c *19/04***
**U.S. Cl. 340—189** **3 Claims**

A system for remotely monitoring the changeable state of a moveable subject employs an illuminator having an electrical resonator which establishes an oscillating "near" magnetic field over the area to be monitored. The illuminator's resonator is driven into resonance and a sensor provides an information signal that is a measure of the oscillatory energy in the resonator. The monitored subject carries a pair of resonant circuits tuned to be set into resonance by inductive coupling to a near magnetic field. One of the resonant circuits is arranged so that its resonant frequency or its energy dissipation (Q) is affected by variations of the monitored state. When at resonance, that resonant circuit causes a change in the oscillatory energy in the illuminator's resonator which is detected by the sensor and appears in the information signal. The other resonant circuit carried by the monitored subject is insensitive to the monitored state and is tuned to a frequency different from the resonant frequency




of the sensitive resonant circuit. When at resonance, the insensitive circuit causes a change in oscillator energy in a resonator which supplies energy to that circuit through a "near" magnetic field. The energy change is detected and a "standard" signal is obtained with which the information signal is compared.

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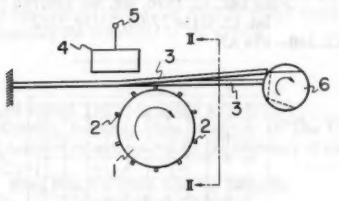
**3,656,133**
**DATA INFORMATION SIGNAL GENERATOR**

**Kiyoshi Ichikawa, Takamatsu-shi, and Akira Fujioka, Tokyo-to, both of Japan, assignors to Kabushiki Kaisha Hitachi Susakusho**

**Filed July 16, 1969, Ser. No. 842,263**
**Claims priority, application Japan, July 17, 1968, 43/50299**
**Int. Cl. G08c *19/16***
**U.S. Cl. 340—207** **14 Claims**



A data information signal generator comprises a plurality of vibrating reeds each mounted to undergo free oscillation, a rotating body having notched portions around it to impart free oscillation to the reeds, another rotating body having around its peripheral surface a plurality of projections to selectively prevent the free oscillation of certain ones of the reeds in accordance with variations in physical quantities, and a detector to detect the existence or non-existence of the free oscillation of the reeds.

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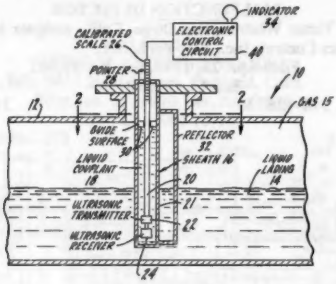
**3,656,134**
**LIQUID LEVEL DETECTOR**

**Fred Brown, Chicago, Ill., assignor to Union Tank Car Company, Chicago, Ill.**

**Filed July 27, 1970, Ser. No. 58,463**
**Int. Cl. G01s *9/66***
**U.S. Cl. 340—244** **18 Claims**

There is disclosed an apparatus for detecting the presence or absence as well as the height of a liquid lading in a vessel comprising; a sheath insert adapted to be inserted into the

vessel whereby at least a portion of the sheath insert is immersed within the liquid lading, a liquid couplant contained within the sheath insert, a transmitting device, a portion of which is located within the sheath insert and is adapted to transmit an ultrasonic signal through the wall of the sheath insert, a receiving device, a portion of which is located within the sheath insert and is adapted to receive the transmitted ultrasonic signal, a first means for establishing a signal path of fixed length through which the ultrasonic signal must travel from the transmitting device to the receiving device wherein a portion of the signal path is adapted to pass through the wall of the sheath insert and into the vessel, and electronic circuit means associated with the transmitting device and the receiving device whereby the electronic circuit means is responsive to the magnitude and time duration of the ultrasonic signal travelling through the fixed signal path thereby indicating the presence or absence of the liquid lading.




In a first preferred embodiment, the first means for establishing the signal path of fixed length comprises a reflector located within the vessel and spaced a fixed distance from the sheath insert wherein the ultrasonic signal from the transmitting device is reflected by the reflector and received by the receiving device in a preselected time interval only when the ultrasonic signal passes through the liquid lading.

In a second preferred embodiment, the first means for establishing the signal path of fixed length comprises a transmitting device located within a first sheath and a receiving device located within a second sheath wherein the first and second sheaths are a fixed distance apart and whereby the ultrasonic signal from the transmitting device is received by the receiving device in a preselected time interval only when the ultrasonic signal passes through the liquid lading between the first and second sheath.

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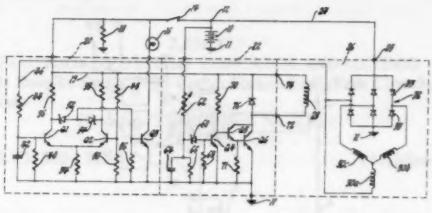
**3,656,135**

## FAULT INDICATOR CIRCUIT FOR VEHICULAR BATTERY CHARGING SYSTEMS

**Donald O. Ruff, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Apr. 29, 1970, Ser. No. 32,850**
**Int. Cl. G08b** *21/00*
**U.S. Cl. 340—248 A** **3 Claims**

First and second Zener diodes respectively connecting first and second output terminals of a differential amplifier to the base of a transistor, the collector of which is connected to an indicator lamp and the emitter of which is grounded. One input to the differential amplifier is connected to a point in the charging system for the vehicle battery such as the output winding of an alternator, and the other input is connected to a reference potential that varies with the rectified output voltage of the alternator. When the output of the charging system varies from predetermined levels, one or both of the Zener diodes break down to bias the transistor into conduction, thereby illuminating the lamp. Otherwise the Zeners effectively remove the bias voltage from the base of the transistor keeping it off.



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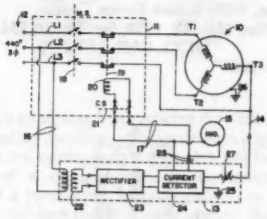
**3,656,136**

## ELECTRIC MOTOR WITH SAFETY SENSING DEVICE

**Darrell J. Blair, Ventura County, Calif., assignor to M. & B. Electric Co. Inc.**

**Filed July 30, 1970, Ser. No. 59,486**
**Int. Cl. G08b** *21/00*
**U.S. Cl. 340—253 R** **1 Claim**




A sensing device is connected to one of the winding terminals of an electric motor and a measure of the winding resistance is effectively determined by the value of current flowing through the terminal. If the winding resistance is too low for safe operation of the motor as might result from moisture in the motor, a control signal is generated by the sensing means which in turn will operate an indicating device to advise operators not to apply the main power source to the motor. The same control signal may be utilized to open a switch in the main powerline and thus prevent application of power of the motor until such time as the motor is in a safe condition for operation.

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**3,656,137**

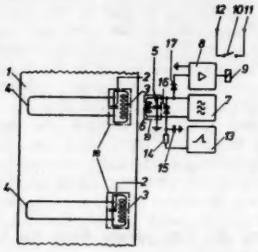
## CONVEYOR BAND MONITORING ARRANGEMENT

**Walter Ratz, Gelsenkirchen, Germany, assignor to Bergwerksverband GmbH, Essen, Germany**

**Filed Nov. 20, 1969, Ser. No. 878,374**
**Claims priority, application Germany, Nov. 22, 1968, P 18 10 387.2**
**Int. Cl. G08b** *21/00*
**U.S. Cl. 340—259** **15 Claims**

An arrangement for monitoring the operating condition of conveyor bands by providing them with conductive loops spaced along the conveying path of the band. Each of the conductive loops short-circuits a respective tuned circuit which can transmit through a receiver situated outside of the conveyor. When a conductive loop ceases to short circuit the tuned circuit because of a tear, for example, the receiver emits a signal directed to a warning circuit and/or a control circuit through which the drive of the conveyor may be

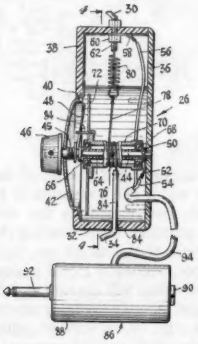
stopped. The tuned circuit is comprised of a capacitor and inductor connected in parallel, and the receiver frequency is wobbled to compensate for any variations in the characteristics of the electrical components, for maintaining the monitoring equipment in operation under such variations in the circuit components.



## 3,656,138
## INFUSION MONITORING DEVICE

**John C. Hamma, Milford, Conn., assignor to Interscience Corporation, Milford, New Haven, Conn.**

**Filed Mar. 18, 1970, Ser. No. 20,554**
**Int. Cl. G08b *21/00***
**U.S. Cl. 340—266** **9 Claims**

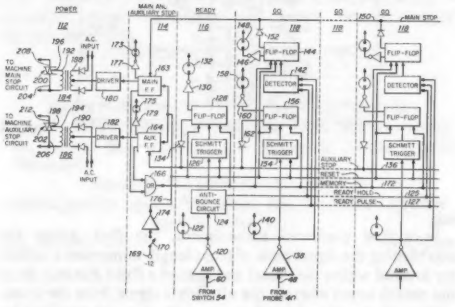


An infusion monitoring device for hospital use, having as its purpose the providing of a signal at the nurse's desk when an infusion (such as an intravenous injection or the like which is being made in a patient's room at a remote location) has progressed to a desired extent. The monitoring device comprises a dial carried by a turnable drum around which there is wound a flexible cable. One end of the cable is attached to a suspension hook on which a bottle containing the supply of infusion liquid is hung. A spring has one end anchored to a casing for the device and has its other end connected with the turnable drum. The drum, dial and spring are contained in the casing, which also carries a settable pointer located in front of the dial. The casing is suspended from the usual type of stand or pedestal commonly utilized for infusion and similar uses. The settable pointer is of metal, and a metal pin extends forwardly from the dial, being engageable with the metal pointer to establish electrical contact thereto. The pointer and the cooperable pin constitute part of an energized control circuit which includes a signal that is activated when contact is established between the pointer and pin. When a bottle of infusion liquid is carried by the suspension of the monitor device, the dial will be rotated in the manner of a weighing scale until equilibrium is established between the weight of the bottle and the force of the extension spring. With the dial at rest, the settable pointer is positioned so as to be a certain distance from its cooperable contact pin on the dial. This distance represents the quantity of the infusion liquid which is to be injected in the patient. As the infusion proceeds, the liquid running out of the bottle will lighten the latter, causing a slow turning of the dial in a direction to cause the contact pin to approach the set pointer. As the pin engages the pointer, the control circuit will be activated, and a signal or indicator thereof, which is located at the nurse's desk, will give an indication that the desired amount of infusion has taken place. The existing nurse's call signal system and circuit may be utilized for the above purpose, whereby these constitute part of the overall control circuit activated by the pointer and dial pin.

## 3,656,139
## MALFUNCTION DETECTOR

**George Victor Wintriss, San Diego, Calif., assignor to Industrionics Controls Inc., New York, N.Y.**

**Filed Apr. 28, 1970, Ser. No. 32,702**
**Int. Cl. G08b *21/00***
**U.S. Cl. 340—267 R** **14 Claims**



A malfunction detector for automatically monitoring and controlling operation of a cyclically operating machine performing one or more operations on work pieces at one or more stations. The detector is of modular construction and includes a circuit for providing a monitoring check cycle and indications that the monitoring cycle has been completed without detecting any malfunctions or that the cycle has not been initiated. Circuitry is also provided for indicating at which individual station any malfunction occurs during the monitoring cycle and for indicating if such malfunction circuitry at any station has become inoperative. Circuitry is also provided for initiating either immediate stoppage of the machine or stoppage at the end of the machine cycle in progress depending on the type of malfunction if the machine is so adapted.

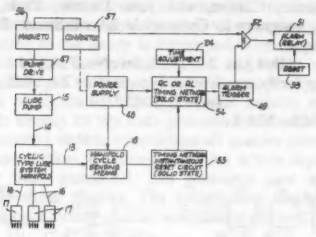
## 3,656,140
## SOLID STATE TIMING CONTROL FOR SINGLE CYCLE PROGRESSIVE LUBRICATING SYSTEMS

**Thomas J. Gruber, Chagrin Falls, and William W. Lyth, Cleveland, both of Ohio, assignors to Eaton Yale & Towne Inc., Cleveland, Ohio**

**Continuation of application Ser. No. 696,948, Jan. 10, 1968, now abandoned , which is a division of application Ser. No. 461,018, June 3, 1965, now Patent No. 3,381,776, dated May 7, 1968. This application Nov. 25, 1970, Ser. No. 92,896**
**Int. Cl. G08b *21/00***
**U.S. Cl. 340—270** **8 Claims**

A lubrication control system for dispensing a measured amount of lubricant within a predetermined period of time

having a lubrication dispensing piston, an electronic timing circuit responsive to movement of the piston and a warning



device controlled by the timing circuit for signalling a failure of the lubricating system to dispense an amount of lubricant within the predetermined time interval.

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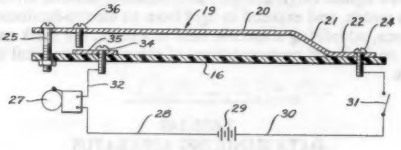
**3,656,141**

## BIRD-SCATTERING DEVICE

**Frank C. Hill, 3033 22nd Avenue, Oakland, Calif.**

**Filed Jan. 23, 1970, Ser. No. 5,198**
**Int. Cl. G08b** *13/10*
**U.S. Cl. 340—272** **2 Claims**



A bird-scattering device operative in response to the weight of the bird alighting thereon to provide an audible alarm effective to frighten birds in the vicinity thereof. The device includes a support casing having a chamber housing therein an electric circuit that comprises an audible alarm in series with a switch operative to complete the circuit whenever a bird alights upon the device. The switch provides as the movable element thereof a large perch normally biased into an inoperative position but displaceable into a closed alarm-energizing position effective to complete the electric circuit whenever a bird lights upon the perch.

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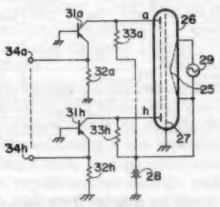
**3,656,142**

## SWITCHING CIRCUIT FOR LUMINOUS DISPLAY TUBES

**Yoshio Tatsuta, Ise, Japan, assignor to ISE Electronics Corporation, Ise, Japan**

**Filed Aug. 26, 1970, Ser. No. 67,001**
**Claims priority, application Japan, Sept. 1, 1969, 44/68940**
**Int. Cl. G09f** *9/00*
**U.S. Cl. 340—324 R** **2 Claims**



In a switching circuit connected between a letter selecting circuit and a luminescent letter display tube there is provided a transistor for each anode electrode of the display tube. The base electrode of the transistor is qrounded, the emitter electrode is suitably biased, the collector electrode is connected to the anode electrode and the control signal is applied to the emitter electrode.

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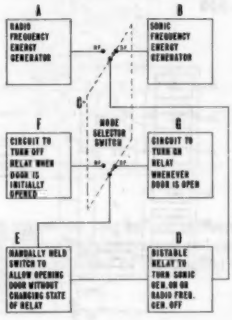
**3,656,143**

## UNAUTHORIZED ENTRY INDICATOR AND METHOD

**Lyle Douglas Smith, 3400 Carlyn Spring Road, Falls Church, Va.**

**Filed Jan. 13, 1970, Ser. No. 2,519**
**Int. Cl. G08b** *13/08*
**U.S. Cl. 340—274** **11 Claims**


A
RADIO FREQUENCY ENERGY GENERATOR
B
SONIC FREQUENCY ENERGY GENERATOR
MODE SELECTOR SWITCH
F
CIRCUIT TO TURN OFF RELAY WHEN DOOR IS INITIALLY OPENED
G
CIRCUIT TO TURN ON RELAY WHENEVER DOOR IS OPEN
E
MANUALLY HELD SWITCH TO ALLOW OPENING DOOR WITHOUT CHANGING STATE OF RELAY
D
BISTABLE RELAY TO TURN SONIC GEN. ON OR RADIO FREQ. GEN. OFF

A preferred apparatus for practicing the method comprises silicon controlled rectifiers with anode gate triggering incorporated in a two mode alarm device that can be attached to the inside of a door. Audible mode indicates by the emittance of a penetrating sound perceived by someone on the inside of the door that it is being opened. Radio frequency mode indicates by the absence of a signal, received on a portable radio outside the door, that the door was opened after the mode switch was locked and left.

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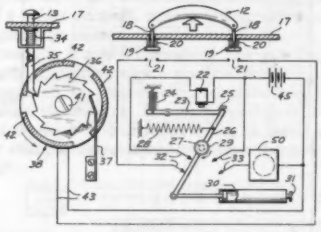
**3,656,144**

## TIME DELAYED THEFT ALARM FOR A CARRYING CASE

**Peter W. Forte, 30 Vassor Place, Rockville Centre, N.Y.**

**Filed June 4, 1970, Ser. No. 43,358**
**Int. Cl. G08b** *13/14*
**U.S. Cl. 340—283** **4 Claims**



A carrying case alarm system has a time-delay mechanism for initiating an alarm signal at some predetermined time after theft of the carrying case has occurred, thereby enabling the owner of the case to separate himself from the thief prior to initiation of the alarm signal. The system comprises a first switch positioned for operation by a carrying handle on the case, the switch being connected to energize

an electromagnet for actuating a pivotal lever. The lever is pivoted by a spring but impeded in its motion by a dashpot, said lever being positioned to close a second switch for energizing the alarm after a predetermined time depending on the pivotal speed of the lever as limited by the dashpot.

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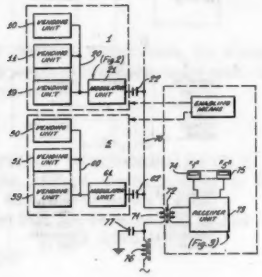
**3,656,145**

## VENDING AND RECORDING APPARATUS

**Sydney E. Proops, London, England, assignor to Quickmaid Rental Service Limited, London, England**

**Filed Mar. 10, 1969, Ser. No. 805,688**
**Claims priority, application Great Britain, Mar. 8, 1968, 11,441/68**
**Int. Cl. G08c *19/12***
**U.S. Cl. 340—310** **8 Claims**



The invention relates to vending and recording apparatus in which an signal generator is actuated when an article is dispensed from the vending machine to transmit modulated carrier frequency signals over a physical line, having a receiving station having a signal receiving and recording apparatus for receiving, demodulating and amplifying carrier frequency signals and for recording cost unit signals representative of the value of the dispensed article.

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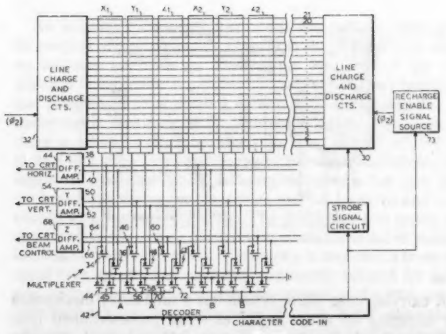
**3,656,146**

## INTEGRATED CIRCUIT CHARACTER GENERATOR

**Carver A. Mead, 2036 Pasadena, Glen Road, Pasadena, Calif.**

**Filed Jan. 25, 1971, Ser. No. 109,136**
**Int. Cl. G06f *3/14***
**U.S. Cl. 340—324 A** **10 Claims**



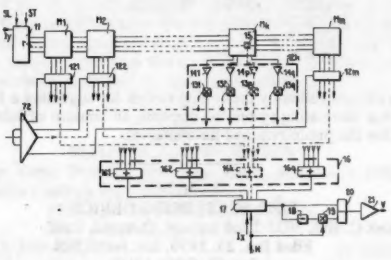

Deflection and intensity control signals suitable for forming characters on the face of the cathode ray tube are derived from suitably shaped charge pick-up plates capacitively spaced from a sequentially excited conductor grid.

**3,656,147**

## SYMBOL DISPLAY SYSTEM FOR MESSAGES RECEIVED IN SIGNAL FORM

**Yvon Fouche, Chatou, and Jean Dansac, Paris, both of France, assignors to Compagnie Internationale Pour L'Informatique**

**Filed Jan. 21, 1969, Ser. No. 792,664**
**Claims priority, application France, July 28, 1968, 137376**
**Int. Cl. G06f *3/14***
**U.S. Cl. 340—324 A** **16 Claims**



Alpha-numerical signals are indicated on the face of a cathode ray tube, the scanning of which is controlled by stored signals derived from photo-sensitive sensors, arranged in a matrix, and exposed to light from an electro-luminescent source, addressing a specific field in a mask, the mask carrying on its fields representations of the alpha-numerical symbols.

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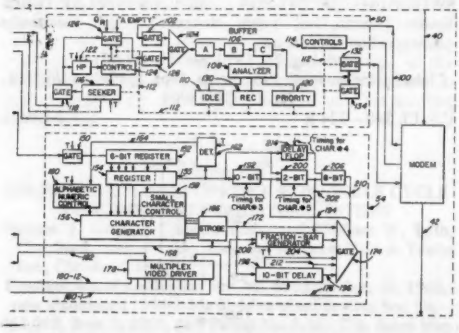
**3,656,148**

## DATA HANDLING APPARATUS

**Richmond D. Belcher, Thornwood; Robert J. Duggan, Bronx, both of N.Y.; George R. Ellis, Trumbull, Conn.; Robert H. Esslinger, Wilton, Conn.; W. Frederick Goodyear, Westport, Conn.; Joseph C. Marshall, Chappaqua, N.Y., and Thomas R. Masone, Stamford, Conn., assignors to The Bunker-Ramo Corporation, Oak Brook, Ill.**

**Original application June 1, 1965, Ser. No. 460,117, now Patent No. 3,500,327, Continuation-in-part of application Ser. No. 370,323, May 26, 1964, now abandoned. Divided and this application Feb. 25, 1969, Ser. No. 839,099**
**Int. Cl. G06f *3/14***
**U.S. Cl. 340—324 A** **12 Claims**




A system for receiving queries from data entry means at a plurality of remote stations and for sending replies from a central station having data storage and data processing means to the appropriate remote station to be displayed on a data presentation means such as a cathode ray tube. The

queries at the remote stations are interrogated by circuitry at an intermediate station. A recirculating memory means is provided at the intermediate station for assembling the query messages. A complete query is transmitted from the intermediate station to the central station where a reply message corresponding to the query is developed. The reply is transmitted back to the intermediate station and stored in a recirculating memory. The reply message is periodically sent as a succession of signals to the appropriate remote station to control the display on the data presentation means. Periodically, the central station interrogates all queries stored at the intermediate station, including those for which replies have previously been generated, and generates new replies in response to these queries. The information display at the remote station is in this manner maintained current.

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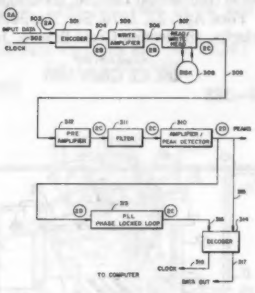
**3,656,149**

## THREE FREQUENCY DATA SEPARATOR

**Keshava Srivastava, Waltham, and Samuel J. Dixon, Hollist, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.**

**Filed Nov. 23, 1970, Ser. No. 91,626**
**Int. Cl. H04l *3/00*; H03r *13/24***
**U.S. Cl. 340—347 DD** **16 Claims**




A three frequency data separator is disclosed. Information which has been recorded on a magnetic storage medium using a three frequency recording technique is decoded by utilizing a phase-locked loop which generates signals at twice the data rate. A preamble existing in the machine and the phase-locked clock are used to generate a "window" in the middle of a cell. The "window" is checked to determine if there is a phase reversal in the middle of the cell; such a phase reversal indicates a ONE whereas the absence of a reversal indicates a ZERO.

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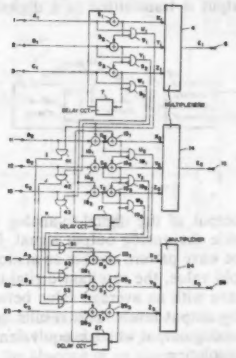
**3,656,150**

## CODE CONVERSION SYSTEM

**Kotaro Kato, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan**

**Filed Feb. 20, 1970, Ser. No. 13,013**
Claims priority, application Japan, Feb. 26, 1969, 44/14814; 44/148415
**Int. Cl. G06f *5/00***
**U.S. Cl. 340—347 DD** **14 Claims**

When providing a summing conversion in a binary system or in a system having a radix of $2^m$, where $m$ is a positive integer equal to or greater than 2, in which a plurality of trains of binary coded signals having a low repetition rate are multiplexed into a single train or a plurality of trains of coded signals of a higher repetition rate with the multiplexed signals representing a summing conversion of input binary signals, the invention performs the logical operations for summing and carry operation on the coded signals of the low repetition rate, and then multiplexes the converted signals into a train or trains of the higher repetition rate. Conversely, a train of binary coded signals or trains of signals coded in $2^m$-coding system of a high repetition rate in which each signal represents a summing conversion are initially demultiplexed according to the invention, into a plurality of trains of coded




signals of a lower repetition rate before performing the logical operations for differential conversion and carry operation to recover the plurality of trains of the original coded signals of the low repetition rate.

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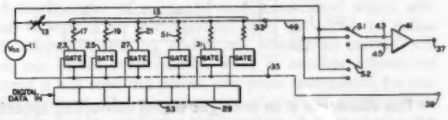
**3,656,151**

## DIGITAL FUNCTION GENERATION NETWORK

**William E. Richeson, Jr., and Mike B. Feher, both of Fort Wayne, Ind., assignors to The Magnavox Company, Fort Wayne, Ind.**

**Filed Mar. 26, 1970, Ser. No. 22,958**
**Int. Cl. H03k *13/04***
**U.S. Cl. 340—347 DA** **5 Claims**




A scheme for transforming input digital information into output analog information where the output is a specified and not necessarily linear function of the input is disclosed. In its simplest form, the circuitry for achieving this result consists of a ladder network, a waveshaping impedance, and a signal generator connected in series. Each rung of the ladder network is a series impedance and gate circuit associated with a specified digital position in the input code and the corresponding impedance is weighted as a function of its positional significance. An output operational amplifier may optionally be provided which serves to invert and appropriately shift the output signal to achieve the desired output waveform.

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**3,656,152**

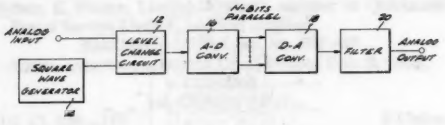
## IMPROVED A-D/D-A CONVERTER SYSTEM

**James L. Gundersen, Carson, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.**

**Filed Feb. 16, 1970, Ser. No. 11,499**
**Int. Cl. H03k *13/02***
**U.S. Cl. 340—347 AD** **11 Claims**

A system for transmitting digital representations of analog signals which increases resolution without a corresponding increase in the number of bits in the digital data which is

transmitted. In one embodiment, the analog input signal is applied to a level change circuit and summed with a square wave having peak-to-peak voltage equal to one-half the magnitude of the value of the least significant bit of the digital representation. The square wave pattern output of the level change circuit is applied to an analog-to-digital converter and the digital output is transmitted to a digital-to-analog converter. The output of the digital-to-analog converter is filtered to provide the analog output signal. During the time that the square wave pattern crosses an analog-to-digital converter threshold value, the resultant digital-to-analog output is a square wave with an average value between the normal discrete analog output levels. This results in twice as many levels at the analog output which is equivalent to the addition of one bit of resolution.

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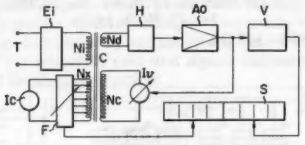
**3,656,153**

**ANALOGUE-DIGITAL CONVERTING APPARATUS**

**Ikuo Takeda; Takashi Suzuki, and Hikaru Furukawa, all of Tokyo, Japan, assignors to Takeda Riken Industry Company Limited, Tokyo, Japan**

**Filed Apr. 7, 1970, Ser. No. 26,301**
**Claims priority, application Japan, Apr. 9, 1969, 44/26858**
**Int. Cl. H03k *13/02***
**U.S. Cl. 340—347 AD** **1 Claim**




This disclosure is an analogue-digital converting apparatus wherein a magnetic core is provided with an input winding, a variable winding in which the number of turns can be changed, a fixed winding of a constant number of turns, and the core also having a magnetic flux detecting winding, these windings being coupled to appropriate circuitry such that, as detected by the flux winding, a flux developed in the core by a current in the input winding can be balanced by current introduced in the fixed and variable windings, the latter current being displayed digitally such that its magnitude can be read with a high precision of more than 8 to 9 digits to represent the magnitude of the input current.

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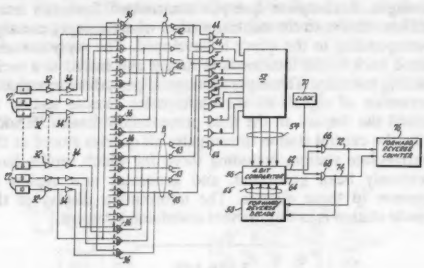
**3,656,154**

**APPARATUS FOR CONVERTING A CYCLIC ANALOG SIGNAL TO A DIGITAL SIGNAL**

**Joseph A. Ross, Fort Salonga, and Hakan O. Hemdal, Huntington, both of N.Y., assignors to Potter Instrument Company, Inc., Plainview, N.Y.**

**Filed Sept. 9, 1970, Ser. No. 70,754**
**Int. Cl. H03k *13/175***
**U.S. Cl. 340—347 AD** **1 Claim**

The specification and drawings disclose 10 photocells arranged to view a full cycle of a space distributed analog signal. Each photocell is coupled to the input of an amplifier whose output rests in one binary state if the input exceeds one level and rests in another binary state if its input falls below another level. Of the large number of combinations in which the binary outputs of the amplifiers can exist, logic circuitry responsive to certain combinations only produces one unique output for each incremental displacement of the periodically varying signal.



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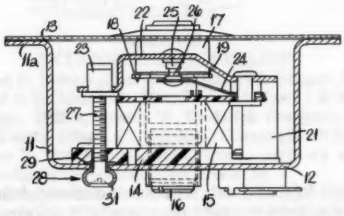
**3,656,155**

**ELECTROMAGNETIC HORNS**

**Eric Bernard Parkes, Birmingham, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England**

**Filed Apr. 22, 1970, Ser. No. 30,869**
**Claims priority, application Great Britain, June 11, 1969, 29,514/69**
**Int. Cl. G08b *3/00***
**U.S. Cl. 340—388** **6 Claims**



An electromagnetic horn comprises a casing, a resilient diaphragm closing the casing, an electromagnet carried by the casing, an armature associated with the electromagnet and secured to the diaphragm and a movable contact within the casing. The movable contact is movable into or out of engagement with the fixed contact by the armature to control energisation of the electromagnet and a bolt extends through the casing and is connected to the fixed contact so that rotation of the bolt relative to the fixed contact adjusts the position of the fixed contact relative to the casing. The head of the bolt is accessible from the exterior of the casing and is engaged in a restraining member which is secured to the casing so as to be immovable relative to the casing in a direction parallel to the axis of the bolt. The restraining member holds the bolt against axial movement relative to the casing but permits angular movement of the bolt relative to the casing.

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**3,656,156**

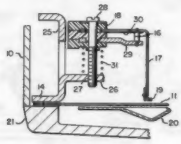
**D.C. VIBRATING HORN**

**Charles Berns, Brookfield, Conn., assignor to Edwards Company, Inc., Norwalk, Conn.**

**Filed July 10, 1970, Ser. No. 53,754**
**Int. Cl. G08b *3/00***
**U.S. Cl. 340—388** **2 Claims**

A D.C. horn apparatus has been provided including an open housing, a diaphragm mounted over the opening in the housing and an electromagnetic means including a circuit breaker contact for providing vibrating motion to the

diaphragm when energized. The improvement includes a resilient vibrating contact mounted at one end to the housing having one contact thereon, a secondary contact arm mounted on the housing at one end and having a second contact engaging said first contact for closing the circuit of the



electromagnetic means, and a resilient damper pad mounted on the free end of the vibrating arm for engaging the diaphragm and transferring motion of the diaphragm when activated by said electromagnetic means for opening the contacts and damping interaction of the vibrating arm and the diaphragm.

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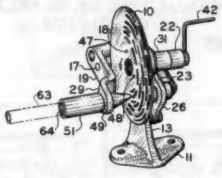
**3,656,157**

## APPARATUS AND METHOD FOR PRODUCING AND TRANSMITTING SIGNALS

**Russell H. Romney, 3259 Bon View Drive, Salt Lake City, Utah**

**Filed May 18, 1970, Ser. No. 38,382**
**Int. Cl. G08b** *3/06*
**U.S. Cl. 340—404** **10 Claims**



Signals, such as elements of the Morse code, are produced by projecting a stream of energy, such as a small gas stream or light beam, against the normally obstructing annular zone of a rotating disc provided with apertures which allow the energy to pass through in a controlled pattern. Means mounting the input stream and the transmitter in axial alignment are mounted for selective shifting to other annuli of the disc; in this way a disc can carry a series of different signals. The transmitter may be a simple transducer, such as an air activated pipe, or whistle, or it may be a light conduit leading to a photosensitive transducer. The tone produced stimulates closely the commercial radio and wireless signals and facilitates teaching the code by means of aural rather than visual images.

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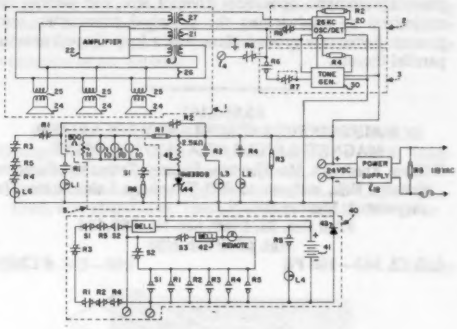
**3,656,158**

## INTEGRATED FULLY SUPERVISED FIRE ALARM SYSTEM

**Harry C. Goodwater, San Francisco, Calif., assignor to Audio Alert Corporation, San Francisco, Calif.**

**Filed Nov. 30, 1970, Ser. No. 93,768**
**Int. Cl. G08b** *21/00*
**U.S. Cl. 340—409** **13 Claims**

A low voltage audio fire alarm system fully integrated in a paging and music speaker system. The alarm circuits including pull-boxes and automatic fire, smoke and heat detection apparatus and the audio circuits are fully and continuously supervised against component failure by means of a plurality of current responsive relays. The audio path including the speaker system and associated amplifiers is continuously monitored by a low level supersonic 26KC signal. Fail-safe



features utilizing multi-contact switches and relays are incorporated throughout the system to prevent inadvertent silencing of alarms in the absence of an alarm condition.

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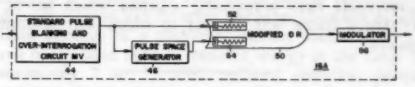
**3,656,159**

## MINIMUM SIZE TRANSPONDER

**Keith M. Kingsbury, Phoenix, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.**

**Filed Mar. 2, 1970, Ser. No. 15,730**
**Int. Cl. H03k** *5/13;* **G01s** *9/56*
**U.S. Cl. 343—6.8 R** **8 Claims**



A transponder of minimum size is disclosed which will, upon receipt of an interrogation, send out a pair of pulses with adjustable spacing, and in one adjustment thereof, will send out pulses continuously, while in another adjustment thereof it will send out pulses, one pulse transmitted for one pulse received. The minimum size of the transponder is attained in part by combining the functions of parts of a known transponder in circuits of minimum size.

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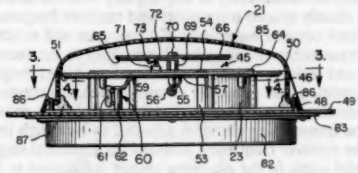
**3,656,160**

## DOWNED-AIRCRAFT RADIO LOCATOR-BEACON EMPLOYING PLURAL LOOP ANTENNAS

**Jay E. Burton, Fort Collins, Colo., assignor to Burton Instrumentation, Inc., Fort Collins, Colo.**

**Filed Feb. 9, 1970, Ser. No. 9,880**
**Int. Cl. H01q** *1/24*
**U.S. Cl. 343—702** **14 Claims**



A compact dual-frequency specially-modulated radio transmitter and combined antenna assembly are mounted in an aircraft. Operation is initiated either automatically in the

event of a crash or manually by a remote control, with the remote control system incorporated in a manner such that severing or shorting of its connections in a crash will not prevent automatic operation. Overall size and airdrag are minimized by sandwiching the principal transmitter components between a ground plane and a loop-shaped antenna parallel thereto.

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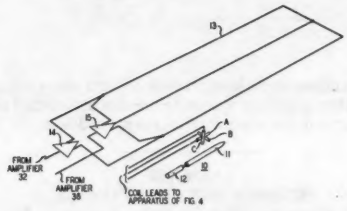
**3,656,161**
**MAINTAINING A CIRCULARLY POLARIZED MAGNETIC FIELD AT A MOVING POINT**

**William Frederick MacPherson, Warren Township, Somerset County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Dec. 31, 1969, Ser. No. 889,464**
**Int. Cl. H04b 7/00**
**U.S. Cl. 343—100 PE** **4 Claims**




A circularly polarized magnetic field is maintained at the location of a subsoil penetrator traveling beneath a dipole-quadrupole field propagating antenna which serves as a reference frame with respect to which the penetrator is guided.

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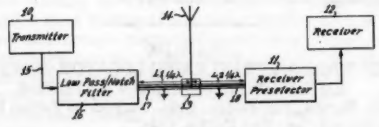
**3,656,162**
**DIPLEXER FOR RADIO COMMUNICATION**

**Thomas Francis Mee, New York, N.Y., assignor to Litton Systems, Inc., Beverly Hills, Calif.**

**Filed Sept. 19, 1969, Ser. No. 859,507**
**Int. Cl. H04b 1/52**
**U.S. Cl. 343—180** **1 Claim**

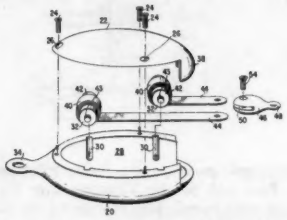



A diplexer enabling radio transmitter and receiver to operate simultaneously or sequentially with the same antenna with closely spaced transmitter and receiver frequencies. The diplexer consists essentially of a low pass and notch filter in the transmitter circuit, a band pass filter in the receiving circuit and series coaxial cables of predetermined lengths in the transmitting and receiving circuits which are connected to a common antenna. The electrical length of the coaxial cable in the transmitting circuit is adjusted to be a high impedance to the receiver frequency, whereas the electrical length of the coaxial cable in the receiving circuit is adjusted to be a high impedance to the transmitter frequency. The low pass filter and the receiver band pass filter may be similar to those normally used in radio communication without diplexing. The notch filter is tuned to reject the wave energy generated by the transmitter at the receiver frequency.

**3,656,163**
**ANTENNA TENSIONING UNIT**

**William C. Rogers, 5363 N.W. 36th Street, Miami Springs, Fla.**

**Filed Jan. 6, 1970, Ser. No. 952**
**Int. Cl. H01q 1/28**
**U.S. Cl. 343—705** **18 Claims**



An aircraft antenna tensioning unit shaped to reduce aerodynamic drag and corona discharge in which the tensional force may be selected after installation of the device on an aircraft without resort to special tools.

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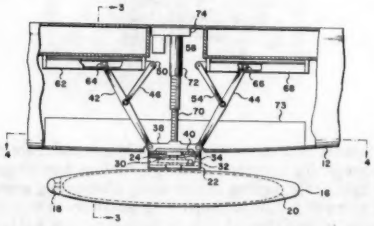
**3,656,164**
**RETRACTABLE AIRCRAFT ANTENNA WITH STREAMLINED RADOME FOR SCANNING**

**Henry F. Rempt, Van Nuys, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.**

**Filed Dec. 4, 1969, Ser. No. 882,200**
**Int. Cl. H01q 1/28**
**U.S. Cl. 343—705** **7 Claims**



A rotatable antenna selectively positionable to an operative location beneath the underside of the fuselage of an aircraft; the antenna being capable of being of a greater longitudinal length than the diameter of the aircraft fuselage, and being selectively retractable, vertically, to a stored position entirely within the aircraft fuselage.

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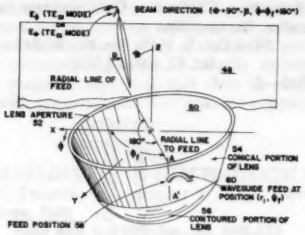
**3,656,165**
**LENS POLARIZATION CONTROL**

**Carlton H. Walter; Roger C. Rudduck, and Charles E. Ryan, Jr., all of Columbus, Ohio, assignors to The Ohio State University Research Foundation, Columbus, Ohio**

**Continuation-in-part of application Ser. No. 431,890, Feb. 11, 1965, now abandoned. This application Sept. 18, 1968, Ser. No. 767,564**
**Int. Cl. H01q 19/06**
**U.S. Cl. 343—754** **6 Claims**

The invention is for a geodesic Luneberg lens antenna structure of nonplanar construction excited by horizontally and vertically polarized electromagnetic energy. Excitation of the lens by a single dual polarized feed will produce two divergent beams — one horizontally and the other vertically

polarized. Excitation of the lens by two separate feeds at locations indicated by application of the criteria disclosed




herein will result in the capability of providing arbitrary elliptical polarization including linear and circular polarization.

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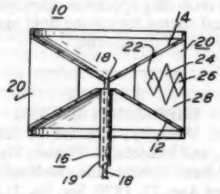
**3,656,166**
**BROADBAND CIRCULARLY POLARIZED OMNIDIRECTIONAL ANTENNA**

**Robert T. Klopach, and Joseph Bohar, both of Lansdale, Pa., assignors to American Electronic Laboratories, Inc., Colmar, Pa.**

**Filed June 5, 1970, Ser. No. 43,771**
**Int. Cl. H01q *19/00***
**U.S. Cl. 343—756** **14 Claims**



An omnidirectional, circular polarized antenna which includes a biconical dipole and a plurality of passive numbers mounted around the axis of the dipole within a boundary formed by a cylinder enclosing the biconical dipole. Each of the passive members includes three diamond shaped metal elements in side-by-side relation and laying in the same plane. The plane of each of the passive members is at an angle with respect to the axis of the biconical dipole.

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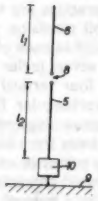
**3,656,167**
**DIPOLE RADIO ANTENNAE**

**Charles A. Lea, Ilford, England, assignor to The Plessey Company Limited, Ilford, England**

**Filed Nov. 25, 1969, Ser. No. 879,753**
**Int. Cl. H01g *9/16, 21/06***
**U.S. Cl. 343—793** **2 Claims**



Dipole whip antenna arrangements are disclosed which are capable of operating over a wide frequency band without the use of continual manual or automatic tuning. This is achieved by connecting the dipole whip antenna to the ground plane through a reactance network which is specially designed so as to match the impedance at the feed point of the dipole arrangement to a desired value over the desired frequency band. For this purpose, the reactance network is an active network, and operates by effectively cancelling out the reactance of the antenna.

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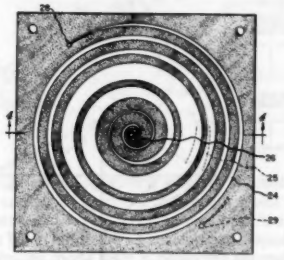
**3,656,168**
**SPIRAL ANTENNA WITH OVERLAPPING TURNS**

**George T. Stropki, Gahanna, Ohio, assignor to North American Rockwell Corporation, El Segundo, Calif.**

**Continuation-in-part of application Ser. No. 856,283, Sept., 1969, now abandoned. This application May 25, 1971, Ser. No. 146,819**
**Int. Cl. H01q *1/36***
**U.S. Cl. 343—895** **2 Claims**



An antenna of the type that radiates a circularly polarized electromagnetic energy field is constructed with one of an included pair of transversely overlapping double-wound spiral conductors secured to a different one of substantially parallel opposite surfaces of a dielectric support means. The improved broad band antenna radiates energy in the range of approximately 2 to 17 GHZ without radiation pattern degradation at higher peak power values in comparison to conventional circularly polarizing antennas.

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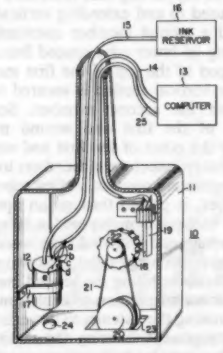
**3,656,169**
**METHOD AND APPARATUS FOR WRITING CHARACTERS**

**Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Kabushiki Kaisha, Tokyo, Japan**

**Filed May 19, 1970, Ser. No. 38,736**
**Claims priority, application Japan, May 23, 1969, 44/39616**
**Int. Cl. G01d *15/18***
**U.S. Cl. 346—1** **10 Claims**




A recording device which is mechanically separated from a processor is manually moved on the recording medium to

record the characters or indicia upon it. The recording of the characters on the recording medium while moving the recording head is accomplished by the stream of ink droplets ejected from the nozzle and control signals transmitted from the processor.

The control signals from the processor to the recording head are generated in response to the displacement signals generated by a signal generating means within the recording head is manually moved.

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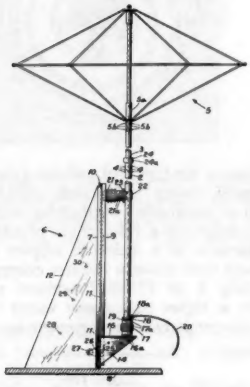
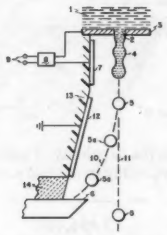
**3,656,170**
**TILTABLE ANTENNA**
**Harry R. Smith, Verona, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.**
**Filed June 25, 1970, Ser. No. 49,680**
**Int. Cl. H01q** *3/02*
**U.S. Cl. 343—882** **10 Claims**



There is disclosed a supporting base for a vertical self-supported shipboard antenna including a vertical section and an antenna element subassembly mounted adjacent the top of the section. The supporting base includes a first member permanently secured to and extending vertically from the deck of a ship and a second member coextensive with the first member having its lower edge spaced from the deck and its top edge hinged to the top of the first member. The lower portion of the vertical section is secured to and electrically insulated from the second member. Screws are passed through one of the first and second members and are threaded into the other of the first and second members to controllably interconnect these members to hold the antenna in a vertical operating position. A first rope is secured to the second member, is passed through an aperture in the first member and engages a pulley and a tubular member supported by the base and a second rope is secured to the vertical section above the hinge point. The two ropes are manipulated to cooperate in tilting the second member and the antenna to a horizontal position to enable maintenance of the antenna and raising the antenna to its vertical operating position. The arrangement securing the vertical section to the second member includes ballast to counterbalance the antenna and to urge the antenna into its vertical operating position.

**3,656,171**
**APPARATUS AND METHOD FOR SORTING PARTICLES AND JET PROP RECORDING**
**John A. Robertson, Chillicothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio**
**Filed Dec. 8, 1970, Ser. No. 96,083**
**Int. Cl. G01d** *15/18*
**U.S. Cl. 346—1** **20 Claims**



Apparatus and method for sorting a spaced progression of particles by selectively applying electrical charges and then subjecting the particle progression to the influence of an electrically conductive surface. Each charged particle in progression past the conductive surface induces thereon a sheet of electrical charge and this sheet in turn causes lateral displacement of the inducing particle. There is further disclosure of jet drop recording apparatus employing sheets of self-induced electrical charge for sorting fluid marking drops into "print" and "no-print" trajectories.

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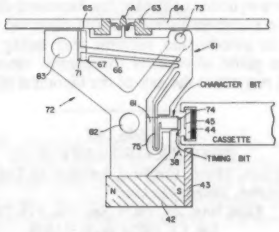
**3,656,172**
**IMPRESSION SENSING**
**Robert E. Wiltz, Wellesley; Edmund D. Schreiner, Newton, both of Mass., and Malcolm C. Winsor, Mount Vernon, Vt., assignors to Athena Systems, Inc., Bedford, Mass.**
**Filed Apr. 27, 1970, Ser. No. 31,925**
**Int. Cl. G06k** *17/00;* **G01d** *15/12*
**U.S. Cl. 346—74 M** **11 Claims**




Embossed OCR characters are sensed and converted into representative seven-bit words on magnetic tape with a timing bit recorded adjacent to each of the seven information bit positions. There are seven feeler pins each centered in a respective one of the four vertical and three horizontal segments that form a rectangular figure-of-eight. Associated with each pin is a narrow edge of low reluctance magnetic material that is urged away from and moved toward magnetic tape in response to the presence and absence, respectively, of a segment in an embossed character being sensed. The magnetic tape is backed by a pole of a permanent magnet, the other pole being magnetically coupled to the sensing elements so that the magnetic flux path is through a narrow edge and the tape. When the narrow edge is close to the tape, the magnetic field strength is sufficient to change the state of that small portion of the magnetic tape opposite the

narrow edge to record there a binary one. When the narrow edge is away, the state of the magnetic tape opposite the narrow edge remains unchanged to record a binary zero. Adjacent to each movable narrow edge is a fixed sharp edge that records a one as a timing signal. In this manner the invention senses an embossed array of characters and converts them to a corresponding array of binarily encoded digital data on a magnetic tape that may then be electronically processed with computers or other utilization apparatus.

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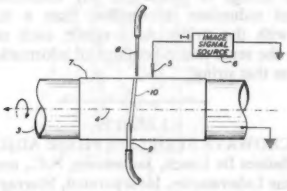
**3,656,173**

**LIQUID DEVELOPMENT OF ELECTROSTATIC IMAGES**

**Rudi Fussel, Teaneck, N.J., assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy**

**Filed Aug. 8, 1969, Ser. No. 848,621**
**Int. Cl. G01d** *15/06, 15/08*
**U.S. Cl. 346—74 ES** **4 Claims**




A liquid developing system for latent electrostatic images is disclosed, wherein a fine stream of liquid developer is directed upon the surface bearing the said image, relative motion being provided between the impinging stream and the surface so that a scan pattern covering the surface is defined by the linear trace of the stream striking the surface. A vacuum pickup head is positioned to follow the linear trace of applied developer, whereby excess liquid is removed from the said surface.

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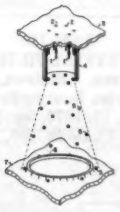
**3,656,174**

**FLUID DROP MARKING APPARATUS**

**John A. Robertson, Chillicothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio**

**Continuation-in-part of application Ser. No. 96,083, Dec. 8, 1970. This application Feb. 26, 1971, Ser. No. 119,230**
**Int. Cl. G01d** *15/18*
**U.S. Cl. 346—75** **4 Claims**



A fluid drop marking apparatus which generates a plurality of fluid marking streams from a set of orifices spaced apart along a closed contour in an orifice plate. The streams are stimulated to create a corresponding set of drop trains and the drops are selectively charged by application of an electrical signal to a conductive surface surrounding the streams at their breakup points. The conductive surface extends downstream for production of outwardly attractive images of the drop charges; thereby causing the charged drops to be deflected outwardly for selective catching by an apertured catching plate. Halftone representations are created by modulation of the applied electrical signal; the nature of the modulation depending upon the type of catching plate aperture employed.

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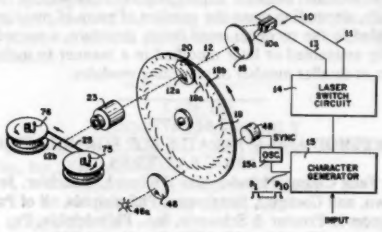
**3,656,175**

**SEMICONDUCTOR DIODE LASER RECORDER**

**Carl O. Carlson, Los Angeles; Herbert L. Bernstein, Gardena, and Albert J. Franco, Los Angeles, all of Calif., assignors to The National Cash Register Company, Dayton, Ohio**

**Filed June 16, 1969, Ser. No. 833,272**
**Int. Cl. G06k** *15/02*
**U.S. Cl. 346—76 L** **10 Claims**




A microimage recording system wherein a semiconductor diode laser is controlled to emit a laser beam which is used to thermally record data on a recording medium. In a first embodiment, the beam emitted by a rectangular shaped junction of a semiconductor diode laser is projected through a suitable optical system including a multi-spirally slotted scanning disc which causes the laser beam to have a scanning action over a moving recording medium for recording highly reduced microimages thereon. In a second embodiment, the beam emitted by each junction of a multijunction semiconductor diode laser is controlled independently thus permitting one or more of the individual junctions to be selectively energized to emit individual laser beams which are directed by suitable optics onto the moving recording medium for the recording of the highly reduced microimages.

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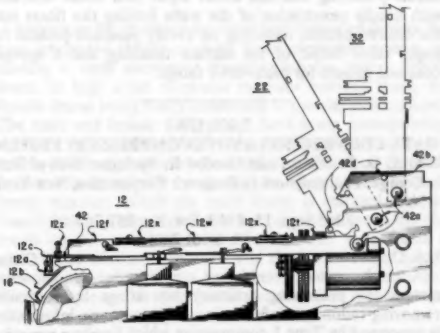
**3,656,176**

**RECORDING MODULE FOR A RECORDER**

**Walton F. Staley, Jr., Philadelphia, Pa., assignor to Leeds & Northrup Company, North Wales, Pa.**

**Filed July 8, 1970, Ser. No. 53,141**
**Int. Cl. G01d** *11/24*
**U.S. Cl. 346—145** **7 Claims**



A round or strip chart recorder preferably of the self-balancing type for recording and indicating the values of a plurality of measured quantities. This recorder is characterized by a plurality of stacked recording modules each

comprised of a pivoted frame including a pair of side plates or arms secured in parallel spaced relation by support shafts which also serve as guide rods for a marker carriage assembly. The frame supports a scale, motor and drive means for the marker carriage, and a marker carriage assembly supporting a marker and index. In a preferred embodiment the recorder is an automatic self-balancing strip chart recorder employing a plurality of pivoted recording modules having capillary pens. Each recording module will additionally include one or more slidewire assemblies and a tray for support of a flexible capillary tube. The use of hinged recording modules provides access for servicing without unplugging or disassembly of any recording module. Each recording module may be disconnected for elimination or replacement of the module without unplugging or disassembly. Additionally, depending upon the number of pairs of pivot points provided in the recorder main frame structure, a recorder is readily assembled or later modified in a manner to include a larger or smaller number of recording modules.

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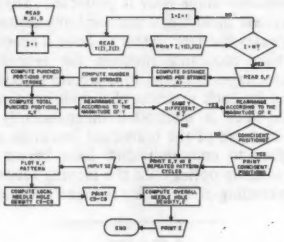
**3,656,177**

## METHOD AND APPARATUS FOR FORMULATING FABRIC PATTERNS

**Seng Fang Chung, Philadelphia; William L. Kuechler, Jenkintown, and George J. Steinbronn, Philadelphia, all of Pa., assignors to Proctor & Schwartz, Inc., Philadelphia, Pa.**

**Filed Mar. 18, 1970, Ser. No. 20,853**
**Int. Cl. G06f** *15/06, 15/20*
**U.S. Cl. 444—1** **10 Claims**



The application of computer technology to the needle punching of fabric wherein the input data of needle density, needle positions, strokes per minute, and fabric feed rate give rise to the plotting of a pattern of needle punches which can be reviewed for desirability. Coextensive webs of fabric of the same color or of different colors may then be fed into a needle punching machine under input data found desirable with needle penetration of the webs forcing the fibers into the desired pattern including an evenly punched pattern for single color fabric or for surface finishing and a special, designed pattern for multi-color fabric.

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**3,656,178**

## DATA COMPRESSION AND DECOMPRESSION SYSTEM

**Paul A. D. De Maine, and Gordon K. Springer, both of State College, Pa., assignors to Research Corporation, New York, N.Y.**

**Filed Sept. 15, 1969, Ser. No. 857,707**
**Int. Cl. G06f** *7/06*
**U.S. Cl. 444—1** **25 Claims**

A high speed, multistage, compressor-decompressor system for processing arbitrary bit strings by reversibly removing redundant information. Alphanumeric information is processed by Type 1 compression which involves removing patterns of contiguous bytes and replacing each removed pattern by decompression information which takes considerably less storage space, and Type 2 compression which involves removing individual redundant bytes and constructing a bit map identifying the location of the removed bytes. Numerical information is processed by a compression technique involving truncation, recursive differencing, sequence removal, packing, and then utilizing the Type 1 and Type 2 compression which are used in conjunction with alphanumeric information. The information which is to be compressed is arranged in strings of bytes and any information defining removal of redundant information from a string is kept together with the string. As a result, each string is self-defined in the sense that it contains all information needed to decompress that string.

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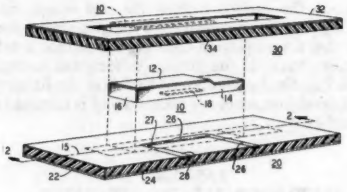
**3,656,179**

## MICROWAVE STRIPLINE PHASE ADJUSTER

**Herman Holmes De Loach, Jamestown, N.C., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Aug. 21, 1970, Ser. No. 66,018**
**Int. Cl. H03h** *7/36*
**U.S. Cl. 333—31** **6 Claims**



This specification describes a microwave stripline phase adjuster wherein the phase of an applied signal is changed by continuous substitution of one dielectric material for another along a length of the stripline circuit path. A constant impedance is maintained by a simultaneous change in the width of the circuit path.

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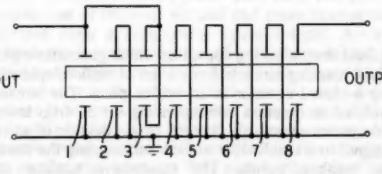
**3,656,180**

## CRYSTAL FILTER

**Arthur Rechtman Braun, Allentown, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Aug. 12, 1970, Ser. No. 63,204**
**Int. Cl. H03h** *7/10, 7/00*
**U.S. Cl. 333—71** **12 Claims**




In a monolithic crystal filter which employs a combination of mass loading and acoustic coupling, a secondary mechani-

cal wave generating resonator with short-circuited, non-grounded electrodes is employed between the input and output resonators. The input wave is applied to the intermediate resonator as well as to the input resonator, resulting in sharp peaks of attenuation which bracket the passband of the filter.

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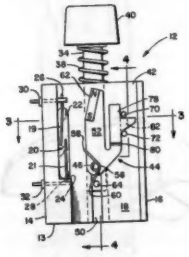
**3,656,181**

## MAGNETICALLY OPERABLE MOMENTARY SWITCH ASSEMBLY

**Howard S. Pack, Park Ridge, Ill., assignor to Teletype Corporation, Skokie, Ill.**

**Filed Oct. 20, 1970, Ser. No. 82,245**
**Int. Cl. H01h** *5/00*
**U.S. Cl. 335—205** **16 Claims**



A magnetic flux field momentarily produces a first reed switch mode upon movement of a permanent magnet to a selected position and aspect in response to depression of a self-restoring manual member. Thereafter, during the depressing stroke, a spring which had been tensioned in response to depression of the manual member is released from a restraint. The untensioning force snaps the magnet to another aspect to effect a second reed switch mode. Cam means comprising the spring restraint also enables return of the permanent magnet from its end stroke position to its start stroke position without change of aspect, whereby the second mode of the reed switch is maintained.

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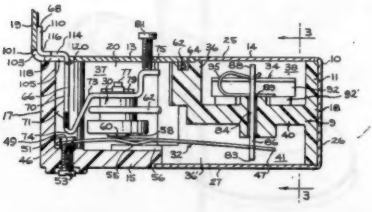
**3,656,182**

## HYDRAULIC THERMOSTAT WITH DOUBLE THROW SWITCH MECHANISM

**Paul R. Staples, Louisville, Ky., assignor to General Electric Company**

**Filed Jan. 8, 1970, Ser. No. 1,382**
**Int. Cl. H01h** *37/20, 37/36, 37/60*
**U.S. Cl. 337—319** **15 Claims**



A single point hydraulic thermostat having a housing enclosing a diaphragm assembly bearing upon a snap-acting spring mechanism with a point contact and controlling the position of a double throw switch mechanism. The housing is closed by a cover. The diaphragm assembly is supported from a bracket member that is connected to the cover by a slip joint. The bracket cooperates with a calibration screw for adjusting the position of the diaphragm. Hinge means are provided for both the bracket and the spring mechanism to prevent relative motion of the point contact between the diaphragm assembly and the spring mechanism during the calibration of the switch. The switch mechanism is fitted with an inclined set of fixed contacts at the top of the housing to facilitate the assembly into the housing of an insulating carrier member with movable contact members. An auxiliary spring member acts between the housing and the carrier to effect holding the top set of switch contacts closed during the initial movement of the spring mechanism until the snap-action occurs to reverse the switch setting so as to avoid contact chatter.

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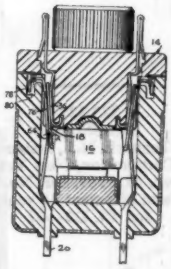
**3,656,183**

## CONNECTOR ASSEMBLY

**Ted B. Walterscheid, Agoura, Calif., assignor to ACS Industries, Inc., Van Nuys, Calif.**

**Filed Feb. 3, 1970, Ser. No. 8,352**
**Int. Cl. H01r** *13/00, 13/54*
**U.S. Cl. 339—17 CF** **10 Claims**



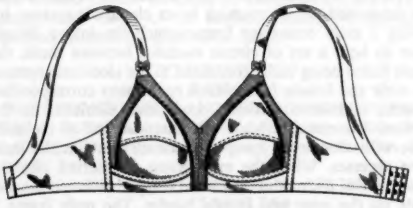
Apparatus for enabling the rapid installation of dual-in-line type integrated circuit modules in an electronic system, including a male connector frame which fits into a female frame to hold a set of circuit modules between them, the female frame being easily connected to the electronic system. The male and female frames each have many corresponding recesses, and have resilient conductive elements in the recesses. The circuit modules are first installed on the male frame with their leads lying over the elements in the male frame recesses. When the male frame is inserted into the female frame, the module leads are trapped between the elements on the male and female frames. The male frame is constructed of plastic material, and the bodies of the circuit modules are held thereon between an elongated heat sink that lies close to the male frame and a retainer member on a side of the modules opposite the heat sink.

# DESIGNS

## APRIL 11, 1972

**223,326**
**EXPANDED CEREAL FOOD PRODUCT**
Leroy F. Duvall, Barrington, and Charles D. Stone, North Barrington, Ill., assignors to The Quaker Oats Company
Filed June 3, 1970, Ser. No. 23,289
Term of patent 14 years
Int. Cl. D1—*01*
U.S. Cl. D1—1

**223,327**
**BRASSIERE**
Charles M. Sachs, Teaneck, N.J., assignor to International Playtex Corporation, New York, N.Y.
Filed Dec. 15, 1969, Ser. No. 20,518
Term of patent 14 years
Int. Cl. D2—*01*
U.S. Cl. D2—24

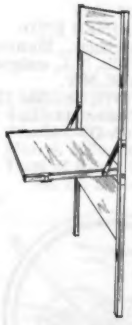


**223,328**
**HAT OR SIMILAR ARTICLE**
Rosemarie T. Kuklinski, 1401 Fairfield Lane, Wildwood, Ill. 60063
Filed Sept. 15, 1970, Ser. No. 25,002
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—257

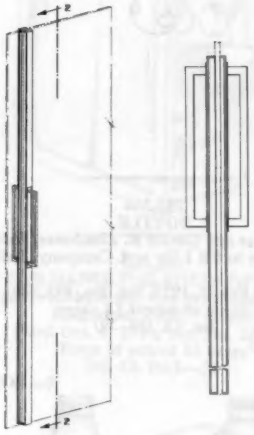
**223,329**
**SHOE**
Takeshi Oshima, Kurume, Japan, assignor to Nippon Rubber Co., Ltd., Tokyo, Japan
Filed Apr. 27, 1970, Ser. No. 22,650
Claims priority, application Japan Jan. 26, 1970
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—310

223,330
**RUBBER GLOVE**
Paul E. Ambrose, Dover, Del., assignor to Pantasote Company, New York, N.Y.
Continuation of design applications Ser. No. 14,439, Nov. 13, 1968, and Ser. No. 17,600, June 9, 1969. This application Jan. 19, 1970, Ser. No. 20,975
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—374

223,331
**COMBINED BUNK BED HEAD BOARD, BLACKBOARD AND FOLDING DESK OR SIMILAR ARTICLE**
Joseph E. N. Neerincx, Uden, Netherlands, assignor to Diks & Coenen N.V., Uden, Netherlands
Filed Jan. 4, 1971, Ser. No. 103,963
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D5—4

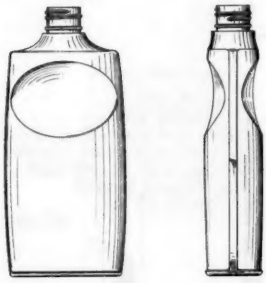


223,332
**COMBINED DOOR HANDLE AND LOCK HOUSING**
William J. Horgan, Jr., Allegheny County, Pa., assignor to Blumcraft of Pittsburgh, Pittsburgh, Pa.
Continuation-in-part of design applications Ser. No. 10,892, Mar. 8, 1968, Ser. No. 13,607, July 18, 1968, Ser. No. 20,195, Nov. 20, 1969, and Ser. No. 21,811, Mar. 9, 1970. This application June 1, 1970, Ser. No. 23,210
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—138



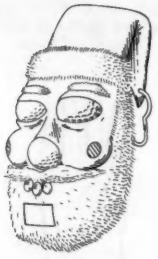
223,333
TOOL HANDLE STRUCTURE
Wallace I. Lindgren, 3723 Dartmouth Drive, Minnetonka, Minn. 55345
Filed Dec. 28, 1970, Ser. No. 26,673
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—83

223,334
BOTTLE
Thomas H. Hayes and Gerald B. Zinnbauer, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.
Filed Feb. 3, 1971, Ser. No. 112,520
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—45

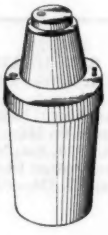


223,335
COMBINED BOTTLE AND CLOSURE THEREFOR
Robert J. Donoghue, 900 Windsor Ave., Windsor, Conn. 06095
Filed Oct. 22, 1970, Ser. No. 25,602
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—10

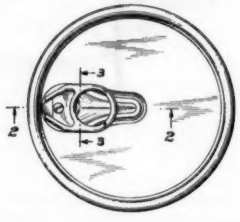
223,336
GIFT PACKAGE FOR GOLF ACCESSORIES
James C. Taylor, Rte. 1, Box 297D, San Marcus, Tex. 78666
Filed Aug. 24, 1970, Ser. No. 24,657
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—193



223,337
DISPENSING CONTAINER FOR CHEMICALS
Joseph Kuchar, Montreal, Quebec, Canada, assignor to Record Chemical Co. Inc., Montreal, Quebec, Canada
Filed May 28, 1970, Ser. No. 23,197
Claims priority, application Canada Mar. 5, 1970
Term of patent 14 years
Int. Cl. D9—*02*
U.S. Cl. D9—218

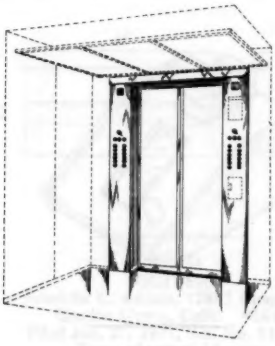


223,338
CONTAINER END
Raymond Luscombe Batchelar, Westwood, and Carl William Heinle, Short Hills, N.J., assignors to American Can Company, New York, N.Y.
Filed July 15, 1970, Ser. No. 23,960
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—255

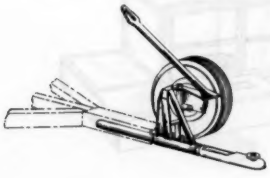


223,339
COMBINED POUR SPOUT AND HANGER FOR A CONTAINER
Joseph Marg, 24043 Greenlawn Ave., Beachwood, Ohio 44121
Original design application Feb. 5, 1969, Ser. No. 15,640. Divided and this application Nov. 16, 1970, Ser. No. 25,979
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—290

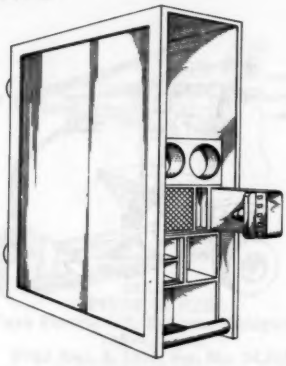
223,340
ELEVATOR CAR ENTRANCE WITH SIGNAL FIXTURES IN THE ENTRANCE COLUMNS
Morrison John Brounn, Flushing, N.Y., assignor to Otis Elevator Company, New York, N.Y.
Original design application July 25, 1967, Ser. No. 7,969. Divided and this application Sept. 2, 1969, Ser. No. 19,132
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D13—1



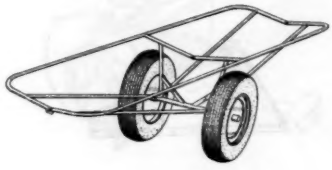
223,341
WHEEL ASSEMBLY FOR TRAILERS
Leroy G. Houger, Star Route, Box 7, Prescott, Wash. 99348
Filed Mar. 4, 1970, Ser. No. 21,726
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—3



223,342
PORTABLE BEVERAGE DISPENSER
Robert L. Smith, Los Angeles, Calif., assignor to Northrop Corporation, Los Angeles, Calif.
Filed Aug. 31, 1970, Ser. No. 24,767
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D14—3



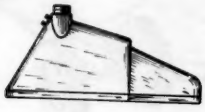
223,343
DOLLY FOR HANDLING ROLLS OF CARPETING
George A. Kirkpatrick, 105 W. Ridgecrest Blvd., Ridgecrest, Calif. 93555
Filed Oct. 6, 1970, Ser. No. 25,350
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D14—3



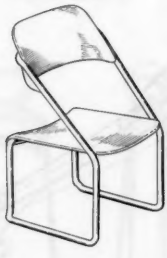
223,344
DRAGSTER
Robert S. Kachler, 1047 Pine Ave., Long Beach, Calif. 90813
Filed Nov. 18, 1970, Ser. No. 26,068
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D14—3

223,345
GOLF CART
Thomas G. Nycum, 216 E. 6th, Wahoo, Nebr. 68066
Filed Dec. 10, 1970, Ser. No. 26,395
Term of patent 7 years
Int. Cl. D12—*02*
U.S. Cl. D14—3

223,346
FUEL TANK FOR SNOWMOBILES
Anthony D. Mackeen, Drummondville South, Quebec, Canada, assignor to Skiroule Limitee, Wickham, Quebec, Canada
Filed Feb. 9, 1971, Ser. No. 114,098
Term of patent 3½ years
Int. Cl. D12—*16*
U.S. Cl. D14—24

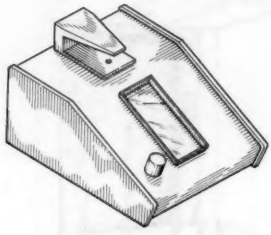


223,347
CHAIR
Thomas Lamb, 349 Wellesley St. E., Toronto, Ontario, Canada
Filed Dec. 1, 1970, Ser. No. 26,239
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D15—1

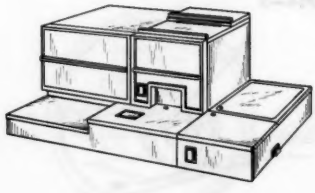


223,348
COMBINED LADDER AND PLATFORM FOR PICKING FRUIT
George H. Boyle, 229 Riverside Ave., Sunnyside, Wash. 98944
Filed June 29, 1970, Ser. No. 23,717
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D15—8

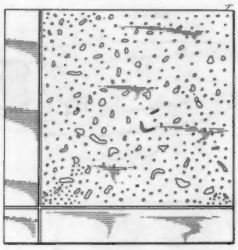
223,349
PHOTOMETER
Harold Y. Minas, Salt Lake City, Utah, assignor to Alpa Corporation, Pleasant Grove, Utah
Filed June 8, 1970, Ser. No. 23,346
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D16—2



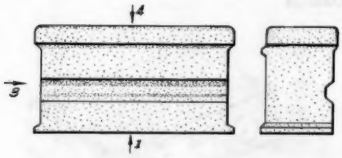
223,350
APPARATUS FOR THE PREPARATION AND EMBEDDING OF TISSUE SPECIMENS
John E. P. Pickett, 3323 Pinafore Drive, Durham, N.C. 27705
Filed June 15, 1970, Ser. No. 23,470
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D16—2



223,351
CEILING PANEL
Paul A. Voigt, Stoneybrook, N.Y., assignor to Johns-Manville Corporation, New York, N.Y.
Filed Sept. 17, 1970, Ser. No. 25,045
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D18—2



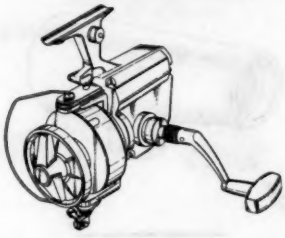
223,352
BUILDING BLOCK
Malcolm Babington Clark, Winchester, England, assignor of fractional part interest to Ronald A. Clark, Shawford, near Winchester, England
Filed Sept. 29, 1970, Ser. No. 25,254
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D18—2



223,353
QUIVER
Franklin E. Adams, 12891 Chaparral, Garden Grove, Calif. 92640
Filed Jan. 27, 1971, Ser. No. 110,360
Term of patent 14 years
Int. Cl. D22—*04*
U.S. Cl. D22—13

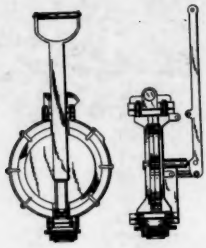
223,354
FISH LURE
Ewell J. Harris, Rte. 3, P.O. Box 135A, Adrian, Mich. 49221
Filed June 8, 1970, Ser. No. 23,358
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

223,355
SPINNING REEL
Fuyo Kuroki, 4–2, 2-chome Nishigaoka, Tokyo, Japan
Filed Sept. 2, 1970, Ser. No. 24,805
Claims priority, application Japan Aug. 18, 1970
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—25

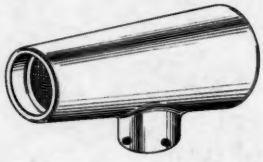


223,356
CONTAINER FOR CHLORINE PELLETS OR THE LIKE
Clellmont L. Sharp, 6204 Eagle Lake Drive, Minneapolis, Minn. 55428
Filed Nov. 2, 1970, Ser. No. 25,766
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—2

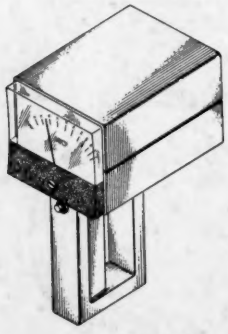
223,357
PUMP
Thomas W. Lacy, Jr., Prairie Village, Kans., assignor to Laco Manufacturing Company, North Kansas City, Mo.
Filed Aug. 11, 1970, Ser. No. 24,430
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—14



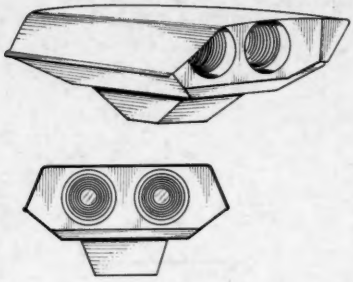
223,358
PIPELINE VENT
William V. Porter, 226 Treasure Way, San Antonio, Tex. 78209
Filed Nov. 6, 1970, Ser. No. 25,864
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—41



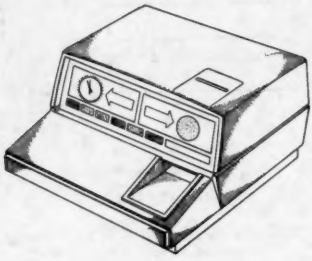
223,359
MICROWAVE TESTING METER
Harold C. Anderson, New Brighton, Minn., assignor to Litton Systems, Inc., Minneapolis, Minn.
Filed Oct. 23, 1970, Ser. No. 25,622
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D26—1



223,360
HOUSING FOR COMMUNICATIONS TERMINAL
Charles J. Ortega, Van Nuys, and Frederic L. Naff, Jr., Los Angeles, Calif., assignors to Computer Transmission Corporation, Los Angeles, Calif.
Filed Feb. 4, 1970, Ser. No. 21,267
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—5

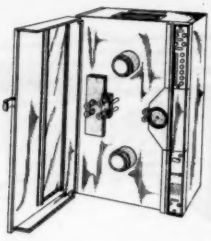


223,361
ELECTRONIC MACHINE FOR USE IN DOCUMENT PROCESSING
William W. Crain, Santa Ana, Calif., assignor to Documentor Sciences Corporation, Santa Ana, Calif.
Filed Mar. 3, 1970, Ser. No. 21,722
Term of patent 14 years
Int. Cl. 14—*02*
U.S. Cl. D26—5

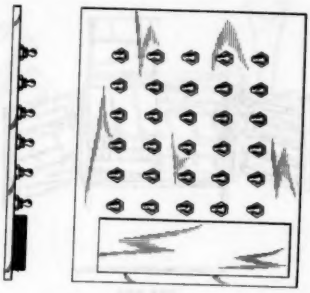


223,362
CATHODE RAY TUBE DISPLAY TERMINAL
Moto Shimano, Clarence D. Zierhut, and Lloyd Y. Ishimaru, Van Nuys, Calif., assignors to Scantlin Electronics, Inc., Los Angeles, Calif.
Filed Aug. 5, 1970, Ser. No. 24,329
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5

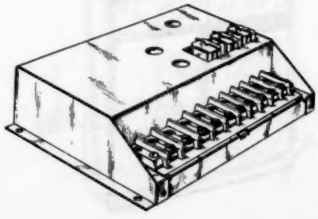
223,363
MAGNETIC TAPE TRANSPORT
Albert W. Martin, Santa Clara, Calif., assignor to Ampex Corporation, Redwood City, Calif.
Filed Oct. 16, 1970, Ser. No. 25,533
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5



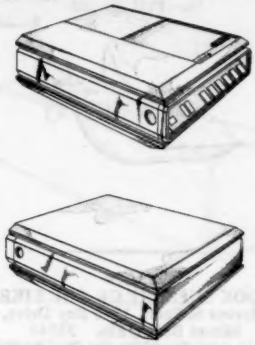
223,364
COMBINED ELECTRONIC TEST PANEL AND NOTATION PAD
Paul V. De Luca, Port Washington, N.Y., assignor to Porta Systems Corp., Port Washington, N.Y.
Filed June 9, 1970, Ser. No. 23,392
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13



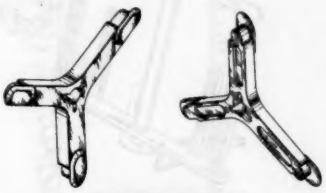
223,365
RELAY CABINET
Robert W. Beckwith, 1002 Greenfield Lane, Mount Prospect, Ill. 60056
Filed Nov. 4, 1970, Ser. No. 25,829
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13



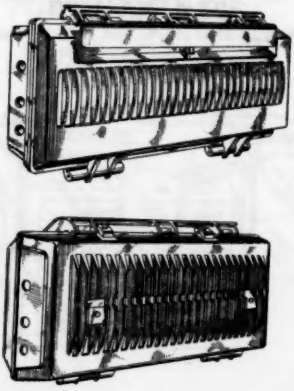
223,366
MAGNETIC TAPE TELEVISION APPARATUS
Orville W. Larson, Elmhurst, Ill., assignor to Ampex Corporation, Redwood City, Calif.
Filed Aug. 27, 1970, Ser. No. 24,719
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D26—14



223,367
MAGNETIC TAPE REEL ADAPTER
John C. Kountz, 1065 Van Dyke Drive, Laguna Beach, Calif. 92651
Filed Aug. 31, 1970, Ser. No. 24,766
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D26—14

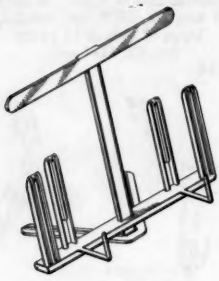


223,368
AMPLIFIER HOUSING
Martin S. Horak, Morganville, N.J., assignor to Vikoa, Inc., Hoboken, N.J.
Filed Sept. 10, 1970, Ser. No. 24,923
Term of patent 14 years
Int. Cl. D14—*04*
U.S. Cl. D26—14

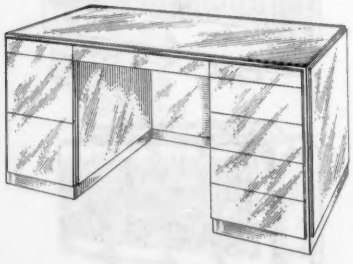


223,369
DOG BOOT
James W. Jackson, 1526A Mews Drive, Kansas City, Mo. 64131
Filed Mar. 6, 1970, Ser. No. 21,770
Term of patent 14 years
Int. Cl. D30—*01*
U.S. Cl. D30—34

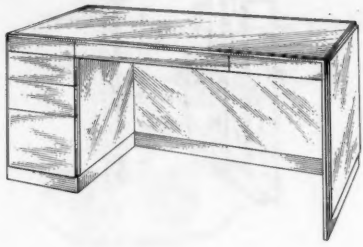
223,370
BOOK SUPPORT OR THE LIKE
Morton S. Pearl, 1940 Bay Drive, Miami Beach, Fla. 33141
Filed Aug. 19, 1970, Ser. No. 24,575
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D33—2



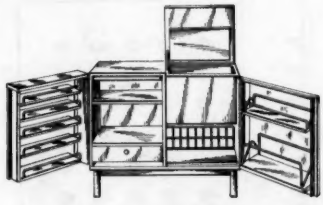
223,371
DESK
Davis B. Allen, New York, N.Y., assignor to The General Fireproofing Company, Youngstown, Ohio
Filed Oct. 8, 1970, Ser. No. 25,382
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D33—7



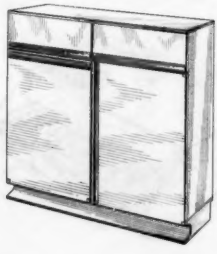
223,372
DESK
Davis B. Allen, New York, N.Y., assignor to The General Fireproofing Company, Youngstown, Ohio
Filed Oct. 8, 1970, Ser. No. 25,383
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D33—7



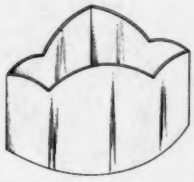
223,373
COMBINED BAR CABINET AND REFRIGERATOR
Leif Elvestad, Skogfaret 17C, Haslum, Norway
Filed Oct. 20, 1969, Ser. No. 19,642
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D33—19



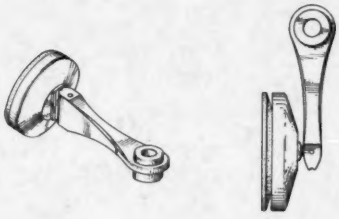
223,374
CABINET
Jacques Firdmann, Grenoble, France, assignor to Etablissements Allibert, Monestier-de-Clermont, Isere, France
Filed July 13, 1970, Ser. No. 23,924
Claims priority, application France Jan. 12, 1970
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D33—19



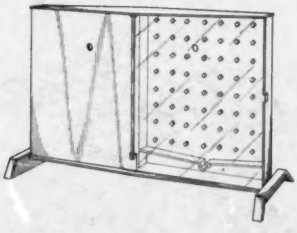
223,375
DRAINAGE TRAY FOR SOAP OR THE LIKE
Julia Smith, 4812 Reynolds Drive, Torrance, Calif. 90505
Filed Sept. 28, 1970, Ser. No. 25,229
Term of patent 7 years
Int. Cl. D6—*06*
U.S. Cl. D33—24



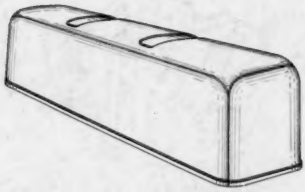
223,376
DISPENSER HOLDER
Steven Kiss, 4565 Tampa St., Philadelphia, Pa. 19120
Filed Nov. 23, 1970, Ser. No. 26,135
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D33—30



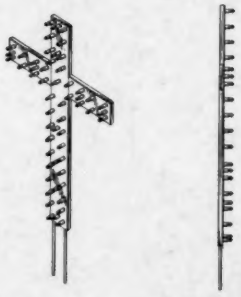
223,377
GAME BOARD
Gordon A. Barlow, Evanston, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.
Filed June 11, 1970, Ser. No. 23,436
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5



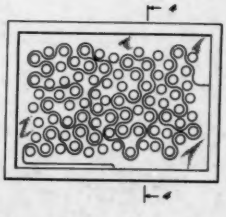
223,378
RIGID, REMOVABLE, PROTECTIVE COVER FOR A GYMNASIUM VAULTING HORSE WITH POMMELS
Lee C. Austin, North Massapequa, N.Y., assignor to R. E. Austin & Son
Filed Sept. 8, 1969, Ser. No. 19,053
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5



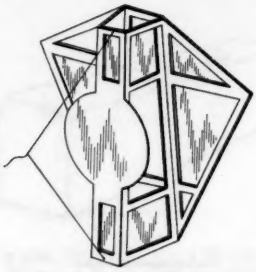
223,379
BASE FOR NATURAL OR ARTIFICIAL FLOWERS
Duncan Tong, 423 Central Bldg., 3 Pedder St., Hong Kong
Filed July 21, 1970, Ser. No. 24,050
Claims priority, application Great Britain Jan. 26, 1970
Term of patent 7 years
Int. Cl. D11—*02*
U.S. Cl. D35—3



223,380
MAGNETIC GAME TABLE
Marjorie M. Kim, San Diego, Calif., assignor to Wilford Cruz, Fullerton, Calif.
Filed Aug. 3, 1970, Ser. No. 24,282
Term of patent 14 years
Int. Cl. D21—*00*
U.S. Cl. D34—5



223,381
KITE
Lindell O. Carpenter, Rye, N.Y., and Robert M. Ferguson, Dallas, Tex., assignors to Container Corporation of America, Chicago, Ill.
Filed Sept. 10, 1970, Ser. No. 24,937
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15

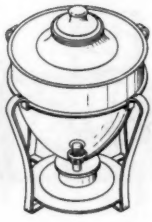


223,382
CLOCK
Robert J. Murray, 900 Sunset Blvd., Suite 1411, Los Angeles, Calif. 90069
Filed Feb. 19, 1970, Ser. No. 21,517
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D42—7

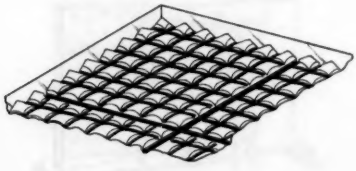
223,383
CAGE FOR A POPCORN POPPER
Robert Gottlieb, New York, N.Y., assignor to Argo Industries Corporation, Jackson Heights, N.Y.
Filed Mar. 25, 1970, Ser. No. 22,056
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D44—1

223,384
CELERY CRISPER OR SIMILAR ARTICLE
Wilfred J. Blease, Greenville, N.H., assignor to Pioneer Plastics, Inc., Greenville, N.H.
Filed Nov. 24, 1970, Ser. No. 26,145
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—1

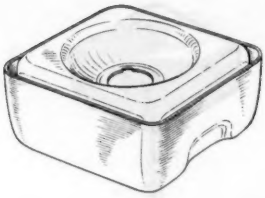
223,385
SAMOVAR OR THE LIKE
Alvin Gruber, 2215 Disston St., Philadelphia, Pa. 19149
Filed Oct. 26, 1970, Ser. No. 25,641
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D44—26



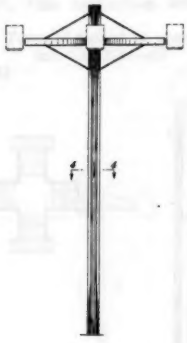
223,386
LENS PANEL
Leo G. Stahlhut, Kirkwood, Mo., assignor to K-S-H, Inc., St. Louis County, Mo.
Filed June 1, 1970, Ser. No. 23,243
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—16



223,387
COMBINED REFLECTOR AND HOUSING FOR TABLE LAMP OR THE LIKE
Sidney Gibson, Suite 110, 57 Godstone Road, Willowdale, Ontario, Canada
Filed June 29, 1970, Ser. No. 23,692
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20



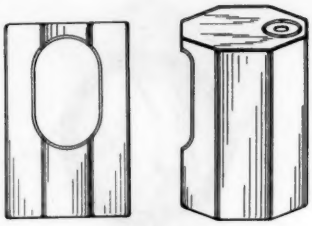
223,388
LIGHT STANDARD OR SIMILAR ARTICLE
Robert Willoughby Selden, Seattle, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.
Filed Sept. 21, 1970, Ser. No. 25,079
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—20



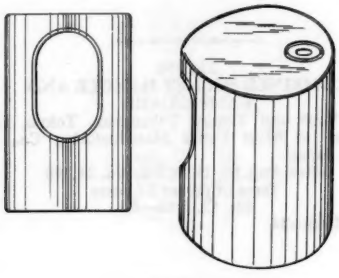
223,389
COMBINED SPOT LIGHT AND PLUG THEREFOR
Arthur Schifrin, 1144 Bay Blvd., Atlantic Beach, N.Y. 11509
Filed Nov. 9, 1970, Ser. No. 25,871
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—20

223,390
COMBINED SOCKET HANDLE AND LAMP GUARD
Shinjiro Mori and Takezo Takamatsu, Tokyo, Japan, assignors to Mori Denki Manufacturing Co., Ltd., Tokyo, Japan
Filed Aug. 10, 1970, Ser. No. 24,398
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24

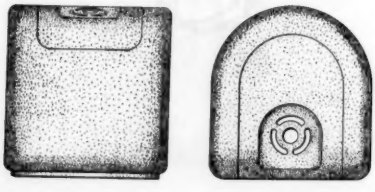
223,391
TABLE LIGHTER
Dieter Rams, Konigstein, Taunus, Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Germany
Filed Mar. 9, 1970, Ser. No. 21,802
Claims priority, application Germany Sept. 11, 1969
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D48—27



223,392
TABLE LIGHTER
Dieter Rams, Konigstein, Taunus, Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Germany
Filed Mar. 9, 1970, Ser. No. 21,806
Claims priority, application Germany Sept. 11, 1969
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D48—27

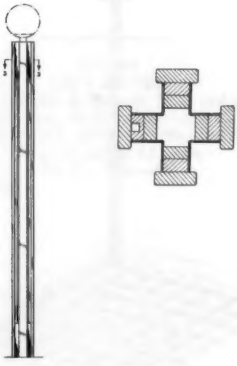


223,393
TABLE CIGARETTE LIGHTER
Dieter Rams, Konigstein, Germany, assignor to Braun A.G., Frankfurt am Main, Germany
Filed Nov. 18, 1970, Ser. No. 26,049
Claims priority, application Germany May 25, 1970
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D48—27



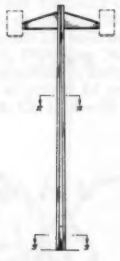
223,394
LUMINAIRE
Eldon L. Anderson, Jr., Fletcher, N.C., assignor to General Electric Company
Continuation-in-part of design application Ser. No. 17,648, June 11, 1969. This application June 15, 1970, Ser. No. 23,477
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—31

223,395
LIGHT STANDARD OR SIMILAR ARTICLE
Robert W. Selden, 2621 36th Ave. W., Seattle, Wash. 98199
Original design application Oct. 20, 1969, Ser. No. 19,635. Divided and this application July 2, 1970, Ser. No. 23,819
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—31



223,396
**LIGHT STANDARD OR SIMILAR ARTICLE**
Robert W. Selden, Seattle, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.
Filed Oct. 20, 1969, Ser. No. 19,634
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—31

223,397
**LIGHT STANDARD OR SIMILAR ARTICLE**
Robert W. Selden, Seattle, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.
Continuation-in-part of design application Ser. No. 19,639, Oct. 20, 1969. This application July 13, 1970, Ser. No. 23,923
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—31

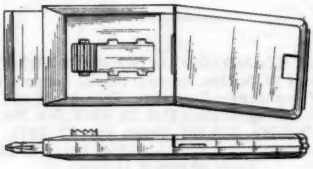


223,398
**LIGHT STANDARD OR SIMILAR ARTICLE**
Robert W. Selden, Seattle, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.
Original design application Oct. 20, 1969, Ser. No. 19,615, now Patent No. 220,535, dated Apr. 20, 1970. Divided and this application Aug. 31, 1970, Ser. No. 24,771
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—31

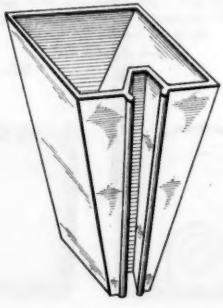
223,399
**LIGHT STANDARD OR SIMILAR ARTICLE**
Robert W. Selden, Seattle, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.
Original design application Oct. 20, 1969, Ser. No. 19,630, now Patent No. 220,581, dated Apr. 27, 1971. Divided and this application Aug. 31, 1970, Ser. No. 24,830
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—31

223,400
LIGHT STANDARD OR SIMILAR ARTICLE
Robert W. Selden, Seattle, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.
Filed Sept. 21, 1970, Ser. No. 25,095
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—31

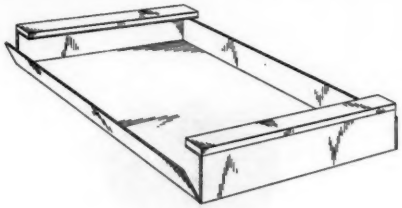
223,401
RAZOR BLADE SCRAPER
Edward H. Meisner, Dumont, N.J., assignor to Red Devil Inc., Union, N.J.
Filed Mar. 23, 1971, Ser. No. 127,436
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D49—23



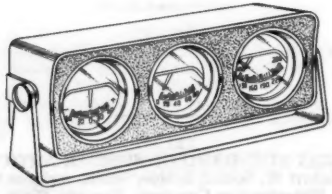
223,402
WASTE PAPER BASKET
Francis P. McGoff, 1570 170th Ave., Hayward, Calif. 94541
Filed May 4, 1970, Ser. No. 22,805
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D49—30



223,403
DISPENSING TRAY FOR PLASTIC BAGS AND THE LIKE
Kenneth A. Smith, 2416 SE. 9th Ave., Portland, Oreg. 97214
Filed Feb. 24, 1969, Ser. No. 15,884
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D52—2



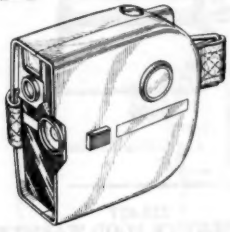
223,404
VEHICLE INSTRUMENT GAUGE
Edwin L. Schwartz, Los Angeles, Calif., assignor to Rite Autoronics Corporation, Los Angeles, Calif.
Filed Apr. 22, 1970, Ser. No. 22,563
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D52—6



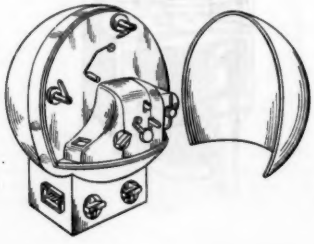
223,405
SPOON OR SIMILAR ARTICLE OF FLATWARE
Siro R. Toffolon, Meriden, Conn., assignor to International Silver Company, Meriden, Conn.
Filed Jan. 21, 1971, Ser. No. 108,686
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D54—12

223,406
SPOON OR SIMILAR ARTICLE OF FLATWARE
Sirio R. Toffolon, Meriden, Conn., assignor to International Silver Company, Meriden, Conn.
Filed Jan. 21, 1971, Ser. No. 108,688
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D54—12

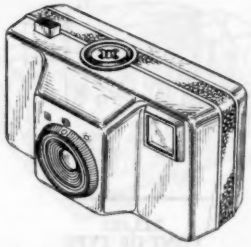
223,407
MOTION PICTURE CAMERA
Shigeo Mizukawa, Ohmiya, and Masahiro Fukuda, Tokyo, Japan, assignors to Fuji Shashin Film Kabushiki Kaisha, Minamiashigara-machi, Ashigarakami-gun, Japan
Filed Apr. 2, 1970, Ser. No. 22,201
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D61—1



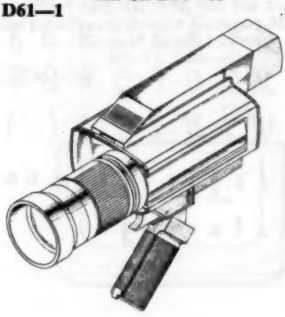
223,408
COMBINED MOTION PICTURE PROJECTOR AND COVER THEREFOR
Eugenio Agrati, Via A da Baggio 20/5, and Ennio Sala, Via A da Baggio 20/13, both of Milan, Italy
Filed Apr. 6, 1970, Ser. No. 22,274
Claims priority, application Italy Oct. 10, 1969
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D61—1



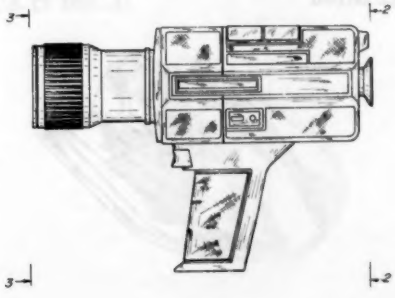
223,409
CAMERA
Masahiro Fukuda, Tokyo, and Shigeo Mizukawa, Ohmiya, Japan, assignors to Fuji Shashin Film Kabushiki Kaisha, Minamiashigara-machi, Ashigarakami-gun, Japan
Filed June 12, 1970, Ser. No. 23,463
Claims priority, application Japan Dec. 17, 1969
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D61—1



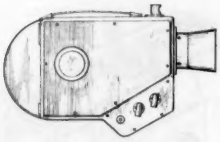
223,410
TELEVISION CAMERA
Orville W. Larson, Elmhurst, Ill., assignor to Ampex Corporation, Redwood, City, Calif.
Filed Sept. 9, 1970, Ser. No. 24,895
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D61—1



223,411
MOTION PICTURE CAMERA
Roland A. Emmerling, Montvale, N.J., assignor to Atlas-Rand Corporation, Paramus, N.J.
Filed Oct. 16, 1970, Ser. No. 25,532
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D61—1

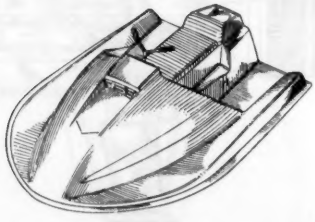


223,412
MOTION PICTURE CAMERA
Lew J. Trenka, 19 Fairmont Ave., Ottawa, Ontario, Canada
Filed Nov. 2, 1970, Ser. No. 25,767
Term of patent 14 years
Int. Cl. D16—*00*
U.S. Cl. D61—1

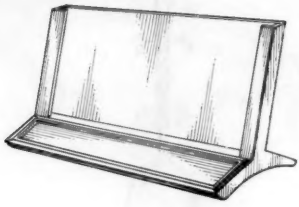


223,413
FONT OF TYPE
William Sandwick, Cleveland, Ohio, assignor to American Greetings Corporation, Cleveland, Ohio
Filed Feb. 2, 1970, Ser. No. 21,197
Term of patent 14 years
Int. Cl. D18—*04*
U.S. Cl. D64—17

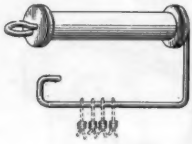
223,414
WATERCRAFT
Yves Anselme Lapointe, Cap-Rouge, Quebec, Quebec, and Pierre Delisle, Tewkesbury, Quebec, Canada, assignors to Bombardier Limited, Valcourt, Quebec, Canada
Filed Aug. 18, 1969, Ser. No. 18,736
Claims priority, application Canada May 30, 1969
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D71—1



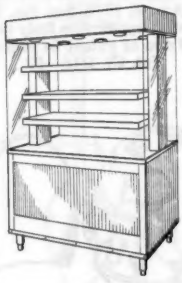
223,415
DESK CALENDAR HOLDER
Henry Finkel, Westmount, Quebec, Canada, assignor to W. L. Plastics and Metal Producers Co. Ltd., Montreal, Quebec, Canada
Filed Feb. 26, 1970, Ser. No. 21,642
Term of patent 7 years
Int. Cl. D19—*03*
U.S. Cl. D74—5



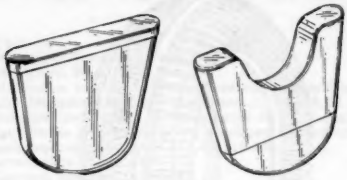
223,416
CLOTHES HANGER TRANSPORTER
Johnny Howard Marshall, 611 Eastland Ave., Ruston, La. 71270
Filed July 15, 1970, Ser. No. 23,973
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D80—8



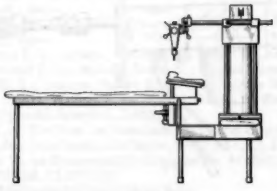
223,417
SELF-SERVICE FOOD WARMER
Robert G. Wilson, 643 E. Faris Road, Greenville, S.C. 29607
Filed Dec. 14, 1970, Ser. No. 26,447
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D81—10



223,418
CORDLESS VIBRATING MASSAGER
Ann M. Hess, 708 3rd Ave. NE., Jamestown, N. Dak. 58401
Filed Apr. 6, 1970, Ser. No. 22,284
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D83—1

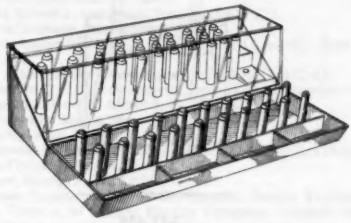


223,419
PRECISION CERVICAL VERTEBRAE ADJUSTING INSTRUMENT
Burl R. Pettibon, 1002 Monterey Lane, Tacoma, Wash. 98466
Filed June 19, 1970, Ser. No. 23,564
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1



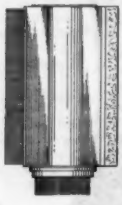
223,420
CIGARETTE DISPENSER
Yoshihisa Tanaka, Ichikawa, Japan, assignor to Tanaka Shoji Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 15, 1971, Ser. No. 106,944
Claims priority, application Japan Aug. 22, 1970
Term of patent 14 years
Int. Cl. D27—*06*
U.S. Cl. D85—2

223,421
HEATER HOUSING FOR HAIR CURLERS
John L. Benty, Scotch Plains, N.J., assignor to Bristol-Myers Company, New York, N.Y.
Filed Feb. 2, 1970, Ser. No. 21,194
Claims priority, application Denmark Aug. 4, 1969
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10

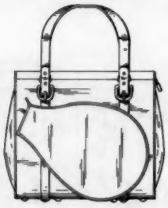


223,422
HAIR DRYER
Dieter Rams, Konigstein, Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Germany
Filed Aug. 31, 1970, Ser. No. 24,785
Claims priority, application Germany Mar. 24, 1970
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10

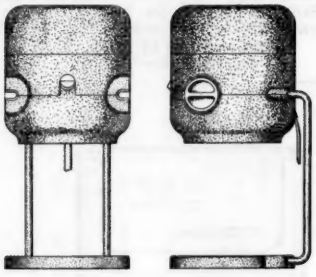
223,423
UNITARY SHOE-POLISHING DEVICE
Andrew W. Brainerd, Kent H. Brainerd, and Stuart W. Brainerd, all of 630 Walden Road, Winnetka, Ill. 60093
Filed May 21, 1970, Ser. No. 23,255
Term of patent 14 years
Int. Cl. D4—*99*
U.S. Cl. D86—11



223,424
COMBINED CARRYING BAG AND RACKET CASE
Samuel N. Glantz and Milton Glantz, both of 1127 W. Division, Chicago, Ill. 60622
Filed Oct. 21, 1970, Ser. No. 25,593
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—1

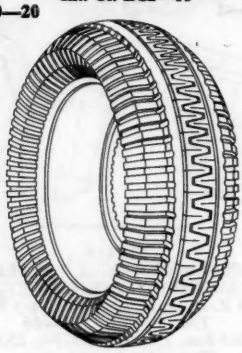


223,425
COMBINED COFFEE MILL AND GRINDER
Florian Seiffert, Zum Talblick, Germany, assignor to Braun A.G., Frankfurt am Main, Germany
Filed Nov. 16, 1970, Ser. No. 26,030
Claims priority, application Germany May 26, 1970
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D89—1

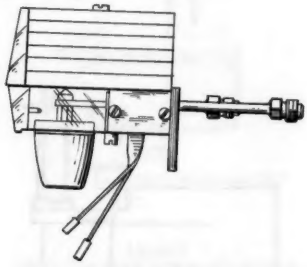


223,426
TIRE
Dennis B. Granger, Akron, Ohio, and Harold D. Fetty, Birmingham, Mich., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed July 27, 1970, Ser. No. 24,126
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D90—20

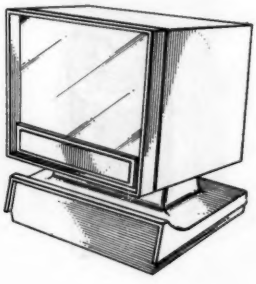
223,427
DUAL PURPOSE VEHICLE TIRE
Eugene Bordinat, Jr., Birmingham, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Dec. 4, 1970, Ser. No. 26,294
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20



223,428
BEVERAGE DISPENSER
Nathan I. Tall, Deal, N.J., and Kenneth I. Tall, New York, N.Y., assignors to Kenco Products Corporation
Filed Sept. 18, 1970, Ser. No. 25,058
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D94—3



223,429
CATHODE RAY TUBE DISPLAY HOUSING
Moto Shimano, Clarence D. Zierhut, and Lloyd Y. Ishimaru, Van Nuys, Calif., assignors to Scantlin Electronics, Inc., Los Angeles, Calif.
Filed Aug. 5, 1970, Ser. No. 24,330
Term of patent 14 years
Int. Cl. D20—*03*; D16—*03*
U.S. Cl. D96—9



# LIST OF PATENTEES

## TO WHOM

## PATENTS WERE ISSUED ON THE 11TH DAY OF APRIL, 1972

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A-T-O Inc.: *See—*
Sievenpiper, Donald A., 3,654,835.
Sievenpiper, Ward, 3,655,204.

Aaland, Kristian, to United States of America, Atomic Energy Commission. Magnetic matrix recording system. 3,656,128, Cl. 340-174.

Aas, Saebjorn; and Brathen, Kare, to Norsk Hydro Verksteder A/S. Gauge cylinder assembly for position indicator and indicator system including such cylinder. 3,654,891, Cl. 116-124.

AB Elektroverken i Gavle: *See—*
Algotsson, Sven Erik, 3,654,663.

AB Volvo Penta: *See—*
Bergstedt, Karl Abdon, 3,654,889.

Abbot, Charles G. Apparatus for converting solar energy to low cost power. 3,654,759, Cl. 60-26.

Abbott Laboratories: *See—*
Ebergardt, Thomas; and Welch, William H., 3,655,083.
Wilson, Earl D.; and Ellmann, Norbert W., 3,654,924.

Abel, Martin L. Package sleeve bearing. 3,655,249, Cl. 308-72.

Abex Corporation: *See—*
Knapp, Kenneth K., 3,654,837.

Abner, Willard. Flexible protective cover for elastic band and methods of incorporation as a part of or attaching to flexible covers, tubes, protective wear, etc.. 3,654,674, Cl. 24-243.

Abreu, Christian O.; Bernhard, John S.; and Chiavaroli, Henry T., to Xerox Corporation. Cleaning apparatus. 3,654,654, Cl. 15-1.5

ACF Industries, Inc.: *See—*
Lazar, Jeffrey Michael, 3,655,170.

Achs, Horst J., to Eaton Corporation. Pallet. 3,654,876, Cl. 108-51.

Ackerman, James H., to Sterling Drug Inc. 3-Cyclic imides of 3-amino-2,4,6-triiodohydro- cinnamic acids. 3,655,669, Cl. 260-281.

Ackerman, James H.; and Laidlaw, George M., to Sterling Drug Inc.Isomers of 2,4,6-trihalo-N,N,N',N'- tetraalkylisophthalamides. 3,655,752, Cl. 260-558.

Ackermann, Hans: *See—*
Meindl, Hubert; Ackermann, Hans; and Von Kaenel, Fred,3,655,665.

ACS Industries, Inc.: *See—*
Walterscheid, Ted B., 3,656,183.

Adams, Francis E.: *See—*
Gifft, Thomas H.; and Adams, Francis E.,3,655,914.

Adams, James E.: *See—*
Haas, Werner E. L.; Adams, James E.; Webster, Becker, James H.; Haas, Werner E. L.; Adams, James E.; Becker, James H.; Haas, Werner E. L.; Adams, James E.; Becker, James H.; Wysocki, Joseph J.; Haas, Werner E. L.; Adams, James E.; Becker, James H.; and Wysocki, Joseph J.,3,655,971.

Adams, John B., to Du Pont de Nemours, E. I., and Company. 2,1,4-Benzothiadiazine-3-carbamic acid ester. 3,655,657, Cl. 260-243.

Adams, William V., to Duramettallic Corporation. Multilayer graphite seal ring. 3,655,206, Cl. 277-87.

Addressograph Multigraph Corporation: *See—*
Turner, Charles L.; and Zerfahs, Arthur S., 3,655,282.

Addressograph-Multigraph Corporation: *See—*
Margulis, Harry; and Miles, William B., 3,655,283.
Miles, William B., 3,655,285.
Seelenbinder, Terrence G., 3,655,184.

Adegeest, Marco, to Corodex N.V. Process for the purification of waste water. 3,655,047, Cl. 210-59.

Adler Process Corporation: *See—*
Alder, Ralph M., 3,655,490.

Advanced Technology Center, Inc.: *See—*
Claytor, Richard N.; and Eden, Dayton D., 3,655,256.

A.G. fur Industrielle Elektronic AGIE Losone Bei Locarno: *See—*
Ullmann, Werner; Tadini, Costantino; and Salim, Ehsan, 3,655,937.

Agency of Industrial Science & Technology: *See—*
Ueda, Terumori; and Imai, Tunemichi, 3,654,785.

Ages, Frederik J., to Honeywell Inc. Electric control valve. 3,654,963, Cl. 137-625.65

Agfa-Gevaert Aktiengesellschaft: *See—*
Herzhoff, Peter; Gref, Hans; and Platz, Stephan, 3,654,899.
Sauer, Theo; and Schulz, Gunter, 3,655,166.
Winkler, Friedrich; and Zanner, Johann, 3,655,278.

Agliata, Thomas P., to Xerox Corporation. Longitudinally insensitive lens strip imaging device. 3,655,284, Cl. 355-18.

Agosti, Ettore. Chair having identical and interchangeable seat and backrest. 3,655,239, Cl. 297-331.

AGSRAD, Inc.: *See—*
Rosen, Ian K.; and Holmgren, William C., 3,654,980.

Ahn, Kie Y.; and Park, Kyu C., to International Business Machines Corporation. Bistable resistor of EuO, EuS, or EuSe doped with 3d transition or VA element. 3,656,029, Cl. 317-235.

Air Products and Chemicals, Inc.: *See—*
Tedeschi, Robert J.; and Natali, Paul W., 3,655,571.

Air Reduction Company, Incorporated: *See—*
Firestone, Alexander H.; Fisk, Robert W.; and Kennedy , Kurt D., 3,655,902.

Airas, Timo. Axial cylinder rotary engine. 3,654,906, Cl. 123-43.

Airey, John M., to G. T. E. Laboratories, Incorporated. Transistorized voltage regulator circuit. 3,656,050, Cl. 322-28.

Aisin Seiki Kabushiki Kaisha: *See—*
Tsubouchi, Kaoru, 3,654,956.

Aitchison, Thomas Edmondston. Evaporators. 3,654,981, Cl. 159-6.

Ajax Flexible Coupling Co., Inc.: *See—*
McAllister, George F., Jr., 3,655,045.

Akashi, Tsuneo; Sugano, Izuru; Okuda, Taneaki; Onodo, Yoshihiro; and Tsuji, Toshiro, to Nippon Electric Company, Limited. Heat treating sintered manganese-zinc ferrites to improve properties. 3,655,841, Cl. 264-66.

Akeley, Lloyd T., to Simmonds Precision Products, Inc. Engine shut-off control system with timer buzzer tell-tale package. 3,656,101, Cl. 340-53.

Akjong Incorporated: *See—*
Sempel, Hendrinus; and Potman, Hendrik, 3,655,839.

Aktiebolaget Electrolux: *See—*
Hagdorn, Manfred Otto, 3,654,953.

Aktiebolaget Hassle: *See—*
Carlsson, Per Arvid Emil; Corrodi, Hans Rudolf; Hallhagen, Sven Goran; and Junggren, Ulf Krister, 3,655,737.

Albright, Charles Jere. Food-broiling apparatus. 3,654,912, Cl. 126-41.

Albright, Charles Jere. Apparatus for pressurized cooking of foods in high-temperature non-aqueous liquids. 3,655,411, Cl. 99-330.

Alburn, Harvey E.; and Dvonch, William, to American Home Products Corporation. Aminocyclopentanecarboxylic acid derivatives. 3,655,725, Cl. 260-468.

Alcock, Richard A.; Guthrie, Robert M.; and Johnston, Robert B., to Fastener Engineers, Inc. Wire drawing and feeding apparatus. 3,654,784, Cl. 72-5.

Alder, Ralph M., to Adler Process Corporation. Apparatus for production of pile carpeting. 3,655,490, Cl. 156-435.

Aleck, Benjamin J., to Arde, Inc. Filament wound spherical pressure vessel. 3,655,085, Cl. 220-3.

Alexander, Delbert S., Jr., to State National Bank. Automatic electric baseball game. 3,655,189, Cl. 273-88.

Algotsson, Sven Erik, to AB Elektroverken i Gavle. Device for closure of boxes, preferentially boxes for enclosure of electrical equipment. 3,654,663, Cl. 16-147.

All American Industries, Inc.: *See—*
Cotton, Robert B., 3,655,303.

Allen & Hanburys Limited: *See—*
Harcourt, David N.; and Brooks, James R., 3,655,651.

Allen, John Wight, to Lubrizol Corporation, The. Nitrogen-, phosphorus- and sulfur-containing lubricant additives. 3,655,556, Cl. 252-32.7

Allen, Robert E.; Thompson, Charles R.; and Hidalgo, John, to Cutter Laboratories, Inc.Method for the production of the (°)-optical isomer of α-racemate 2-(2-ethyl-2-phenyl-1,3-dioxo-lan-4- yl)-piperidiene. 3,655,680, Cl. 260-293.67

Allied Chemical Corporation: *See—*
Anello, Louis G.; Sweeney, Richard F.; and Litt, Morton H., 3,655,677.
Crescentini, Lamberto, 3,655,819.
Gilbert, Everett E.; and Dear, Robert E. A., 3,655,786.
Hoare, Robert C., 3,655,640.
Lofquist, Robert A.; and Hayes, Brendan T., 3,655,821.
Meneghini, Carlo; Mayer, Richard Eugene; Lazarus, Stanley David; and Rainer, Norman Barry, 3,654,679.
Mueller, Max B.; Salatiello, Peter P.; and Kaufman, Herman S., 3,655,611.
Page, Walter; Schevey, William R.; and Vander Mey, John E., 3,655,533.
Wincklhofer, Robert C.; and Weedon, Gene C., 3,655,858.

Allis, Louis, Company, The: *See—*
Bourke, Robert F.; and Simons, Jon W., 3,656,006.

Almanna Svenska Elektriska Aktiebolaget: *See—*
Burstrom, Martin; and Nilsson, Jan, 3,654,687.

Alpha Advanced Systems, Inc.: *See—*
Friederichs, Josef E.; Friederichs, Edgar E.; and Weg, Leo, 3,655,052.

Alsthom-Savoisienne: *See—*
Laser, Georges; and Bornet, Daniel, 3,656,077.

Altman, David: *See—*

Altman, Murray; Altman, David; and Altman, Seymour E.,3,655,135.
Altman, Murray; Altman, David; and Altman, Seymour E., to Thermasol, Ltd. Steam outlet head with a dispenser for a fragrance or medicant. 3,655,135, Cl. 239-310.
Altman, Seymour E.: *See—*
Altman, Murray; Altman, David; and Altman, Seymour E.,3,655,135.
Aluminum Company of America: *See—*
Dunn, Lloyd G., 3,654,796.
Mac Zura, George; and Pearson, Alan, 3,655,339.
Sopp, Albert L., Jr., 3,655,467.
Amano, Yosinao: *See—*
Mase, Takehisa; Kawaura, Hirosi; Yamaguchi, Terumoto; and Amano, Yosinao,3,655,142.
Amerace Esna Corporation: *See—*
Malia, Michael W., 3,656,084.
Americal Corporation: *See—*
Minton, Clarence W., 3,654,778.
American Can Company: *See—*
Hirn, Hans, 3,655,026.
LaCroce, Leonard Thomas, 3,655,091.
American Cyanamid Company: *See—*
Hauser, Martin; and Hoinacki, Christine Elizabeth, 3,655,622.
House, Ronald Raymond, 3,655,431.
Kemp, Gordon Arthur; Bachmann, Howard John; Berkelhammer, Gerald; and Asato, Goro, 3,655,890.
Lucas, Howard Robert, 3,655,606.
Smith, Terry Edward, 3,655,830.
American Electronic Laboratories, Inc.: *See—*
Klopach, Robert T.; Bohar, Joseph; Klopach, Robert T.; Bohar, Joseph; Klopach, Robert T.; and Bohar, Joseph, 3,656,166.
American Home Products Corporation: *See—*
Alburn, Harvey E.; and Dvonch, William, 3,655,725.
American Hospital Supply Corporation: *See—*
Lelugas, Joseph J., 3,655,179.
American Maize Products Company: *See—*
Campbell, Charles S., 3,655,443.
American Novawood Corporation, The: *See—*
Barrett, Lawrence G., 3,654,877.
American Optical Corporation: *See—*
Wilkinson, Leonard A., 3,655,276.
American Standard, Inc.: *See—*
Clayton, John B., III, 3,654,988.
Fichter, Barry, 3,654,957.
Young, Sherwood L., 3,654,637.
American Velcro, Inc.: *See—*
Rinecker, Franz G., 3,655,118.
Ames, W. R., Company: *See—*
Held, Charles J., Jr., 3,655,159.
AMF Incorporated: *See—*
Gianese, Goffredo, 3,655,080.
Jacoby, William F., 3,655,219.
Amiard, Yves; and Bellissent, Jean-Paul, to Societe Anonyme dite: Societe Nationale des Petroles d'Aquitaine. Cycloalkenyl tricycloalkenes used to produce elastomers by copolymerisation with olefines. 3,655,796, Cl. 260-666.
Amicon Corporation: *See—*
Hausslein, Robert W.; and Molvar, Henry E., Jr., 3,655,432.
Amoco Production Company: *See—*
Richardson, James D., 3,654,649.
Silverman, Daniel, 3,654,886.
AMP Incorporated: *See—*
Kinkaid, Robert John, 3,656,093.
Landry, Thomas J., 3,655,063.
Swengel, Robert Charles, Sr.; and Lemke, Timothy Allen, 3,656,092.
Ziegler, George William, Jr.; Apa, Armand Samuel; and Heffner, Donald Elwood, 3,654,793.
Anaconda Company, The: *See—*
Delaney, John F., 3,655,044.
Andersen, Harry M.; Morris, David C.; and Tolbert, Tommy L., to Monsanto Company. Method of making a contoured composite product. 3,655,863, Cl. 264-294.
Anderson, Andrew W., to Scandia Packaging Machinery Company. Apparatus for punching holes in heat shrinkable web material. 3,654,829, Cl. 83-78.
Anderson, John E.; Parish, Clyde E.; and Ross, George H., to Signal Chemical Company, mesne. Amino carbonate adducts and method of making same. 3,655,719, Cl. 260-463.
Anderson, Richard M.: *See—*
Wygant, James C.; Anderson, Richard M.; and Prill, Erhard J.,3,655,726.
Andersson, Curt Erik Ingvar, to Kockum Soderhamn AB. Arrangement for collecting material and removing it perpendicularly to its longitudinal direction. 3,655,073, Cl. 214-16.
Andree, George C. Instrument for use in the graphic arts. 3,655,960, Cl. 240-6.46
Andress, Harry J., Jr., to Mobil Oil Corporation. Fuels and lubricants containing aminoguanidine antioxidants. 3,655,560, Cl. 252-51.5
Andrews, David; and Saucy, Gabriel. 6-Alkyl-substituted tetrahydropyran-2-ols and process for their production. 3,655,695, Cl. 260-340.5
Androkitis, John L., to Armstrong Cork Company. Article alignment device on a packaging machine. 3,655,078, Cl. 214-6.
Anello, Louis G.; Sweeney, Richard F.; and Litt, Morton H., to Allied Chemical Corporation. N,N-Di-substituted amides of polyfluoro-alkoxy- carboxylic acids. 3,655,677, Cl. 260-295.
Angus Engineering Company, Inc.: *See—*
Costello, Bernard J., 3,655,173.
Angus, George, & Company Limited: *See—*
Smith, Brian Lawrence; and Robertson, Rodger William, 3,655,310.
Anhalt, John W.; Maston, James W.; and Selvin, Gerald J. Terminal junction system. 3,656,091, Cl. 339-198.
Anthony's Manufacturing Company, Inc.:*See—*
Stromquist, Michael E., 3,655,939.
Antonen, Robert C.; and Kookootsedes, Gust J., to Dow Corning Corporation. Silicone-polybutadiene resins. 3,655,598, Cl. 260-18.
Antonucci, Joseph M.: *See—*
Wall, Leo A.; and Antonucci, Joseph M.,3,655,785.
Aoyama, Ryozo; Koiwai, Akira; and Yamada, Kenji, to Kabushiki Kaisha Komatsu Seisakusho (Komatsu Ltd.). Internal combustion engine starting system in a hydraulic power transmission system. 3,654,758, Cl. 60-19.
Apa, Armand Samuel: *See—*
Ziegler, George William, Jr.; Apa, Armand Samuel; and Heffner, Donald Elwood,3,654,793.
Appleton, Arthur I. Wrapping device. 3,654,668, Cl. 24-16.
Arbuckle, Timothy; and Sullivan, Herbert, to Computer Modem Corporation. Signal preconditioning method and transmission system. 3,656,108, Cl. 340-146.1
Archibald, John Leheup, to Wyeth, John, & Brother Limited. 3-[2-(4-Cyclohexanecarboxamido-1-piperidyl)- ethyl] indole. 3,655,674, Cl. 260-293.61
Architectural Fiberglass, Inc.: *See—*
Deeds, Douglas; and Rosengrant, Barry L., 3,655,253.
ARDAC/USA Incorporated: *See—*
Bayha, Jack E., 3,655,186.
Arde, Inc.: *See—*
Aleck, Benjamin J., 3,655,085.
Argus Chemical Corporation: *See—*
Kauder, Otto S.; Leistner, William E.; and Hecker, Arthur C., 3,655,832.
Armbrust, Herbert: *See—*
Sturm, Hans Juergen; Armbrust, Herbert; Nienburg, Hans; and Eisfeld, Wolfgang, ,365,574.
Armour Pharmaceutical Company: *See—*
Bossinger, Charles D.; and Enkoji, Takashi, 3,655,892.
Armstrong Blum Manufacturing Company: *See—*
Wilkin, John P., 3,655,025.
Armstrong Cork Company: *See—*
Androkitis, John L., 3,655,078.
Armstrong, David P.: *See—*
Moore, Robert M.; Lauterbach, Norman H.; and Armstrong, David P.,3,655,968.
Armstrong, Richard James, to Decalock Limited. Door latch. 3,655,230, Cl. 292-169.
Arni, Urs; Faucci, Adriano; and Stocker, August, to Lonza Ltd., Gampel (Valais). Process for the production of malonic acid dinitrile and purification thereof. 3,655,721, Cl. 260-465.8
Arpax Company , The: *See—*
Johnson, George R., 3,655,500.
Art Metal-Knoll Corporation: *See—*
Savage, Robert H., 3,655,292.
Artamonova, Nadezhda Ivanovna; Bushin, Leonid Mikhailovich; Besedin, Leonid Nikolaevich; Zhurenko, Anna Timofeevna; Urvantsev, Leonid Mikhailovich; Scherbakov, Jury Dmitrievich; Yasjukevich, Boris Ivanovich; Demin, Anatoly Anisimovich; and Peshkov, Evgeny Viktorovich. Appliance for automatic thread piecing in spinning or spinning and twisting machines. 3,654,756, Cl. 57-34.
A/S Norsk Vitefabrikk: *See—*
Hover, Borre, 3,655,961.
Asaoka, Junichi: *See—*
Yamamoto, Shohei; Watanabe, Jun; Hosoi, Susumu; Kuwazaki, Masahiro; Ota, Akira; Takata, Toshikatsu; and Asaoka, Junichi,3,655,449.
Asato, Goro: *See—*
Kemp, Gordon Arthur; Bachmann, Howard John; Berkelhammer, Gerald; and Asato, Goro,3,655,890.
Aschberger, Anton A.; and Bartels, Herbert D., to Continental Can Company, Inc. Can welding indexer. 3,654,810, Cl. 74-54.
Ashby, Eugene C. Stable complexes of organomagnesiums with alkali metal hydrides. 3,655,790, Cl. 260-665.
Ashby, Robert L. Clutch rebuilding and testing mechanism. 3,654,805, Cl. 73-118.
Astor-Werk Otto Berning & Co., Firma: *See—*
Berning, Rudolf, 3,654,671.
Athena Systems, Inc.: *See—*
Wiltz, Robert E.; Schreiner, Edmund D.; and Winsor, Malcolm C., 3,656,172.
Atlantic Richfield Company: *See—*
Chao, Tai S.; and Roush, Allan N., 3,655,562.
Fauber, Eugene M.; and Moyer, Hallard C., 3,655,563.
Hoffman, William D.; and Larson, Allen E., 3,655,414.
Mitchell, Maurice M., Jr.; Fisher, Harold M.; and Tomezsko, Edward S., 3,655,792.
Mitchell, Maurice M., Jr.; Fisher, Harold M.; and Tomezsko, Edward S., 3,655,800.

Schuh, Frank J., 3,654,766.
Sherman, Paul David; and Chloupek, Frank J., 3,655,704.
Smith, Frank W.; and Parker, Patrick N., 3,654,993.
Yoo, Jin Sun, 3,655,811.

Atwell, William J.; and Cranston, Lawrence, to Uniroyal, Inc. Textile reinforced all-polymeric hose and method of making same 3,654,967, Cl. 138-144.

Audio Alert Corporation: *See*—
Goodwater, Harry C., 3,656,158.

Audn Corporation: *See*—
Brendle, Thomas A., 3,655,955.

Aumuller, Walter: *See*—
Weber, Helmut; Weyer, Rudi; Aumuller, Walter; Muth, Karl; and Stach, Kurt,3,655,756.

Aurora Equipment Company: *See*—
Ervin, William D., 3,655,068.

Austin Company, The: *See*—
Jansen, Karl, 3,654,986.

Automatic Devices, Inc.: *See*—
Grafius, Gerald R., 3,655,042.

Automation Development Corporation: *See*—
White, Frank F., 3,655,067.

Automobiles Peugeot: *See*—
Goetz, Bernard, 3,654,692.

Avery Products Corporation: *See*—
Burton, Robert, 3,655,492.

AVM Corporation: *See*—
Ditonto, Alexander N.; and Lindros, Charles J., 3,655,125.
Martin, Afton V.; and Modovan, Michael T., Jr., 3,654,709.

Babcock & Wilcox Company, The: *See*—
Forrer, Gilbert R., 3,655,983.

Babikyan, Jirair A., to Sanders Associates, Inc. Self-starting single phase motor. 3,656,040, Cl. 318-168.

Bacha, John D.; and Selwitz, Charles M., to Gulf Research & Development Company. Selective extraction of meta-chlorotoluene. 3,655,783, Cl. 260-650.

Bachmann, Howard John: *See*—
Kemp, Gordon Arthur; Bachmann, Howard John; Berkelhammer, Gerald; and Asato, Goro,3,655,890.

Bachura, Richard A., to Dow Corning Corporation. Composition and process for preparing flexible polyester based polyurethane foams. 3,655,581, Cl. 252-351.

Bader, Henry; and Boag, Alexander, to Polaroid Corporation. Continuous process for making hydroxylamines. 3,655,764, Cl. 260-584.

Badische Anilin- & Soda-Fabrik AG: *See*—
Pommer, Horst; Mueller, Herbert; and Overwien, Hermann, 3,655,768.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See*—
Mueller-Tamm, Heinz; and Hofmann, Alfred, 3,655,504.
Pommer, Horst; Mueller, Herbert; Mangold, Dietrich; and Overwien, Hermann, 3,655,735.
Sturm, Hans Juergen; Armbrust, Herbert; Nienburg, Hans; and Eisfeld, Wolfgang, .365,574.
Wisseroth, Karl; and Scholl, Richard, 3,655,834.

Bagdasar, Florica. Teaching aid kit. 3,654,712, Cl. 35-73.

Baggett, Joseph M., to Dow Chemical Company, The. Water-soluble polyalkanolamine resins. 3,655,506, Cl. 162-164.

Bailey, James R., to Switchcraft, Inc. Electrical plug. 3,656,089, Cl. 339-110.

Bailey, Roddie F., to United States of America, Navy. Marine mine self protection system. 3,654,888, Cl. 114-240.

Bajars, Laimonis: *See*—
Croce, Louis J.; Bajars, Laimonis; and Gabliks, Maigonis,3,655,805.

Baker, Alexander; and Vosika, Eugene A., to Integrated Mechanical Systems, Inc. Electronic component handler and tester. 3,655,041, Cl. 209-81.

Baker, Edmond M.: *See*—
Mellen, Edward J., Jr.; Baker, Edmond M.; and Webb, John M.,3,654,984.

Baker, Hayward. Fluid flow transfer device. 3,655,298, Cl. 417-196.

Baker, Lamar T., to General Instrument Corporation, mesne. Memory utilizing the non-linear input capacitance of an MOS device. 3,656,119, Cl. 340-173.

Baldwin, John J.: *See*—
Balhofer, William A.; and Baldwin, John J.,3,655,894.

Balhofer, William A.; and Baldwin, John J., to Merck & Co., Inc. Compositions for inhibiting gastric acid secretion. 3,655,894, Cl. 424-250.

Ballsmith, George C.; and Knoche, Richard C. Auxiliary tool handle. 3,654,975, Cl. 145-75.

Banaitis, Raymond: *See*—
Stollman, Irving; and Banaitis, Raymond,3,655,034.

Barabas, John J., to Castro Convertibles Corporation. Hinged-seat platform for sofa-bed. 3,654,642, Cl. 5-13.

Barcia, Manuel: *See*—
Vazquez, Eugenio A ; and Barcia, Manuel,3,654,969.

Barie, Walter P., Jr., to Gulf Research & Development Company. Polytetraallyl benzophenonetetracarboxylate. 3,655,499, Cl. 161-88.

Barmag Barmer Maschinenfabrik Aktiengesellschaft: *See*—
Lenk, Erich; and Krawszik, Theodor, 3,655,314.

Barmby, David S.: *See*—
Kirsch, Francis W.; Potts, John D.; and Barmby, David S.,3,655,813.

Barnard, James W. Selectively illuminable toy. 3,654,710, Cl. 35-29.

Barnes, Bertron Otis. Screw drivers. 3,654,974, Cl. 145-50.

Barrett, Lawrence G., to American Novawood Corporation, The. Knockdown warehouse pallet. 3,654,877, Cl. 108-56.

Barrington, Jonathan, to Insul-Fil Manufacturing Company. Water-repellant thermal insulating composition. 3,655,564, Cl. 252-62.

Bartels, Herbert D.: *See*—
Aschberger, Anton A.; and Bartels, Herbert D.,3,654,810.

Bartl, Herbert: *See*—
Wingler, Frank; Dietrich, Werner; Bartl, Herbert; and Kraft, Karl-Josef,3,655,589.

Bartlett, Clarence; Bartlett, Laurence D.; and Bartlett, Dale. Rotating cylinder engine. 3,654,907, Cl. 123-44.

Bartlett, Dale: *See*—
Bartlett, Clarence; Bartlett, Laurence D.; and Bartlett, Dale,3,654,907.

Bartlett, Laurence D.: *See*—
Bartlett, Clarence; Bartlett, Laurence D.; and Bartlett, Dale,3,654,907.

Bartucci, John F.; and Horton, James A., to Goodyear Aerospace Corporation. Simulator having an infinite-depth-of-field optical pickup. 3,655,260, Cl. 350-45.

Baso, Loris. Buckle attached to ski boot. 3,654,670, Cl. 24-70.

Bastone, Andrew L.; Boeker, Justin R.; and Klimpl, Fred E., to Owens-Corning Fiberglas Corporation. Fluid-handling constructions, apparatus and methods of production. 3,655,468, Cl. 156-62.2

Bateman, Charles Donald, to Sundstrand Data Controls, Inc. Aircraft instrument. 3,654,806, Cl. 73-178.

Bateman, Lawrence Giles, to Delamere & Williams Company Limited. Carton handling apparatus. 3,655,072, Cl. 214-8.5

Bates, Leonard E., to Cardic Machine Products, Inc. Rug cleaning machine. 3,654,662, Cl. 15-302.

Bates, Ralston Everett: *See*—
Wood, Arthur Eastman; Marvin, Ralph Edward; and Bates, Ralston Everett,3,656,073.

Batzer, Hans: *See*—
Lohse, Friedrich; Schmid, Rolf; Fisch, Willy; and Batzer, Hans,3,655,817.

Bauer, Stuart Michael: *See*—
Price, Richard Thompson; Bauer, Stuart Michael; Brownlee, John; and Goberde, Bastiaan Cornelis,3,655,838.

Bauernfeind, Carl J.; and Zeman, Raymond F., to International Business Machines Corporation. Time interval measuring and accumulating device. 3,656,060, Cl. 324-186.

Bavitz, Joseph F.: *See*—
Morgans, David J.; Bavitz, Joseph F.; and Castello, Robert A.,3,655,742.

Baxter, James Fletcher; and Debbas, Samir Costandi, to Du Pont de Nemours, E. I., and Company. Electrostatic repelling cylinders for filament flyback control. 3,655,305, Cl. 425-83.

Baxter Laboratories, Inc.: *See*—
Funkhouser, Harold F.; and Daugherty, Charles W., 3,655,317.

Bayha, Jack E., to ARDAC/USA Incorporated. Stacker for paper currency. 3,655,186, Cl. 271-88.

Bazouin, Andre; and Lefort, Marcel, to Rhone-Poulenc S.A. Process for the preparation of aryldimethylchlorosilanes. 3,655,710, Cl. 260-448.2

Bean, Dorothy Aday: *See*—
Bean, Frank R.; and Bean, Dorothy Aday,3,655,195.

Bean, Frank R.; and Bean, Dorothy Aday. Word forming game apparatus. 3,655,195, Cl. 273-135.

Beau, Raymond; and Fourniquet, Jean, to Produits Chimiques Pechiney-Saint-Gobain. Agglomerated silica bodies and method. 3,655,580, Cl. 252-317.

Beccone, John Peter; Kurokawa, Kaneyuki; and Schlosser, Wolfgang Otto, to Bell Telephone Laboratories, Incorporated. Multiphase digital modulator. 3,656,069, Cl. 332-16.

Becher, Heinz-Manfred; and Sehring, Richard, to Boehringer Ingelheim G.m.b.H.Novel O-(2-alkyl-4,6-dinitro-phenyl)- O'-(α-carbalkoxy-alkyl)-carbonates. 3,655,717, Cl. 260-463.

Beck, Roland D., to International Telephone and Telegraph Corporation. Positioning device. 3,656,082, Cl. 337-366.

Becke, Friedrich; and Hagen, Helmuth. Production of 3-chloro-1,2-benziosothiazoles. 3,655,686, Cl. 260-304.

Becker, Gustav; Griepentrog, Heinz; Klebert, Wolfgang; and Reich, Friedrich, to Farbenfabriken Bayer Aktiengesellschaft. Process for textiles with aqueous liquors of polyisocyanates and silica sols. 3,655,437, Cl. 117-161.

Becker, James H.: *See*—
Haas, Werner E. L.; Adams, James E.; Webster, Becker, James H.; Haas, Werner E. L.; Adams, James E.; Becker, James H.; Haas, Werner E. L.; Adams, James E.; Becker, James H.; Wysocki, Joseph J.; Haas, Werner E. L.; Adams, James E.; Becker, James H.; and Wysocki, Joseph J.,3,655,971.

Beckers, Hans, to Hamac-Hansella GmbH. Method of making composite packages. 3,654,746, Cl. 53-37.

Becklin, Dennis M., to Crate-Rite, Incorporated. Portable equipment case. 3,655,215, Cl. 280-79.2

Beckman Instruments, Inc.: *See*—
Marovich, Frank A.; and Wilson, Ray I., 3,655,546.
Reinhard, Clyde J.; and Miller, Donald D., 3,656,065.

Strickler, Allen, 3,655,541.
Van Slooten, Nico J., 3,655,020.
West, Charles David, 3,655,958.
Beckman, Joseph A.: *See—*
Kay, Edward L.; and Beckman, Joseph A.,3,655,599.
Becorit Grubenausbau GmbH: *See—*
Dischler, Helmut, 3,654,799.
Becton, Dickinson Electronics Company: *See—*
Lincoln, Thomas C.; and Voge, Andrew, 3,655,925.
Belcher, Richmond D.; Duggan, Robert J.; Ellis, George R.; Esslinger, Robert H.; Goodyear, W. Frederick; Marshall, Joseph C.; and Masone, Thomas R., to Bunker-Ramo Corporation. Data handling apparatus. 3,656,148, Cl. 340-324.
Belder Trust, Reg.: *See—*
Otto, Fritz, 3,655,139.
Bell, Charles H.: *See—*
Carder, Frank B.; Stumpe, Warren R.; Frassetto, Bruno S.; and Bell, Charles H.,3,655,075.
Carder, Frank B.; Stumpe, Warren R.; Frassetto, Bruno S.; and Bell, Charles H.,3,655,076.
Bell, Clarence R. Rope splicing implement. 3,654,755, Cl. 57-23.
Bell Telephone Laboratories, Incorporated: *See—*
Beccone, John Peter; Kurokawa, Kaneyuki; and Schlosser, Wolfgang Otto, 3,656,069.
Braun, Arthur Rechtman, 3,656,180.
Busick, Richard Cobbold; and Masucci, Eugene Daniel, 3,655,921.
Chang, William Shen Chie, 3,655,261.
Curran, Robert Kyran; Kerwin, Robert Eugene,; and Shankoff, Theodore Arthur, 3,655,527.
De Loach, Herman Holmes, 3,656,179.
Irvin, John Calhoun, 3,655,540.
Krause, John Thorvald; and Kurkjian, Charles Robert, 3,655,255.
Laane, Rein Raymond, 3,655,919.
Laane, Rein Raymond, 3,655,920.
Mac Pherson, William Frederick, 3,656,161.
Pasternack, Gerald P., 3,656,122.
Runge, Peter Klaus, 3,656,068.
Wolff, Peter Adalbert, 3,655,993.
Bellissent, Jean-Paul: *See—*
Amiard, Yves; and Bellissent, Jean-Paul,3,655,796.
Beltrami, Joseph P., to Stad Alarm Systems, Inc. Anti-hijacking vehicular alarm system. 3,656,100, Cl. 340-63.
Bendix Corporation, The: *See—*
Keefer, Richard D.; and Wyman, John S., Jr., 3,654,801.
Morton, Henry Clifford; and Rasmussen, Thomas J., 3,655,603.
Benfur Engineering Company: *See—*
De Groot, John E., 3,654,736.
Bennett, Sydney, to Shaw, Joshua, & Sons Limited. Control device for a hydrostatic transmission and a hydrostatic transmission embodying such a device. 3,654,760, Cl. 60-52.
Benno, Edward L. Livestock feeding machine. 3,654,977, Cl. 146-70.1
Beny, Janos; Bosley, Denis V.; and Kennedy, Melvin R., to Mattel, Inc. Toy means for measuring toy vehicle drag and/or drift. 3,654,728, Cl. 46-39.
Benz, Mark G., to General Electric Company. Sintered cobalt-rare earth intermetallic process using solid sintering additive. 3,655,463, Cl. 148-101.
Benz, Mark G., to General Electric Company. Process of preparing liquid sintered cobalt-rare earth intermetallic product. 3,655,464, Cl. 148-101.
Bergstedt, Karl Abdon, to AB Volvo Penta. Hydraulic system for a boat drive. 3,654,889, Cl. 115-35.
Bergstrom Paper Company: *See—*
Guenther, Karl R.; and Havekost, Donald G., 3,655,608.
Bergwerksverband G.m.b.H.: *See—*
Ratz, Walter, 3,656,137.
Berkelhammer, Gerald: *See—*
Kemp, Gordon Arthur; Bachmann, Howard John; Berkelhammer, Gerald; and Asato, Goro,3,655,890.
Berkus, Clyde C., 50% to Diversified Designs Services. Vent unit. 3,654,850, Cl. 98-61.000
Bernhard, John S.: *See—*
Abreu, Christian O.; Bernhard, John S.; and Chiavaroli, Henry T.,3,654,654.
Berning, Rudolf, to Astor-Werk Otto Berning & Co., Firma. Button, in particular a cushion padding-button. 3,654,671, Cl. 24-102.
Berns, Charles, to Edwards Company, Inc. D.C. vibrating horn. 3,656,156, Cl. 340-388.
Bernstein, Herbert L.: *See—*
Carlson, Carl O.; Bernstein, Herbert L.; Franco, Albert J.; Carlson, Carl O.; Bernstein, Herbert L.; Franco, Albert J.; Carlson, Carl O.; Bernstein, Herbert L.; and Franco, Albert J.,3,656,175.
Berry, Jack; and Luo, Zong-Shyong, to Burroughs Corporation. Screw engaging device. 3,654,816, Cl. 74-424.8
Bertin, Ira L.: *See—*
Bertin, Mannie; and Bertin, Ira L.,3,654,851.
Bertin, Mannie; and Bertin, Ira L. Diffusers for conditioned air conduits. 3,654,851, Cl. 98-110.
Bertsch, Walter: *See—*
Martinez-Alvarez, Francisco; Ruiz, Ricardo Garcia; De Porras, Jaime Molinae; Merino Del Rio, Jose Luis; and Bertsch, Walter,3,655,789.
Besedin, Leonid Nikolaevich: *See—*
Artamonova, Nadezhda Ivanovna; Bushin, Leonid Mikhailovich; Besedin, Leonid Nikolaevich; Zhurenko, Anna Timofeevna; Urvantsev, Leonid Mikhailovich; Scherbakov, Jury Dmitrievich; Yasjukevich, Boris Ivanovich; Demin, Anatoly Anisimovich; and Peshkov, Evgeny Viktorovich,3,654,756.
Bethlehem Steel Corporation: *See—*
Shah, Dipak Co.; Ward, George W.; and Whiteley, Roger L., 3,655,349.
Utley, Ronald W., 3,655,350.
Bettcher Industries, Inc.: *See—*
Fetzer, Fred; and Miranda, Ronald P., 3,654,664.
Betzler, Warren F. Portable thermographic duplicator. 3,655,970, Cl. 250-65.
Bevilacqua, Frank; and Runde, Herbert A., to Combustion Engineering, Inc. Control rod position transmitter. 3,656,074, Cl. 335-206.
Bianchi, Louis A. Adapter for attaching signs to a non-cylindrical sign-post. 3,654,718, Cl. 40-145.
Biet, Jean: *See—*
Leblond, Jean; Biet, Jean; and Danneels, Guy,3,654,828.
Bilotti, Anthony G., to Warner-Lambert Company. Sugarless gum containing dicalcium phosphate dihydrate. 3,655,866, Cl. 424-48.
Binford, Jack C.; Ethridge, Fredrick A.; and Talbot, James R., to Fiber Industries, Inc. Apparatus for bulking yarn. 3,654,677, Cl. 28-1.3
Birch, James D.: *See—*
Monaghan, Stephen R.; and Birch, James D.,3,656,070.
Birtwell, William Clifford, to Medical Innovations, Inc. Process and apparatus for synchronous assisting of blood circulation. 3,654,919, Cl. 128-64.
Birum, Gail H.; and Matthews, Clifford N., to Monsanto Company. Phosphoranylidene substituted cyclic compounds. 3,655,766, Cl. 260-586.
Bissonette, Vernon L.: *See—*
Brault, Albert T.; and Bissonette, Vernon L.,3,655,382.
Bither, Tom Allen, Jr., to Du Pont de Nemours, E. I., and Company. Palladium phosphide chalcogenides. 3,655,348, Cl. 23-315.
Bitonit, Paul A., to Ross Operating Valve Company. Sequence valve. 3,654,958, Cl. 137-596.14
Blackwell, Ray E. Pet-door-containing insert unit for a sliding-door frame. 3,654,733, Cl. 49-168.
Blaiklock, Paul M.: *See—*
Hatch, Richard W., Jr.; and Blaiklock, Paul M.,3,654,947.
Blair, Darrell J., to M. & B. Electric Co., Inc. Electric motor with safety sensing device. 3,656,136, Cl. 340-253.
Blanc-Guenee, Janine L.: *See—*
Gautier, Jean A.; Miocque, Marcel Y.; Moskowitz, Henri; Blanc-Guenee, Janine L.; Raynaud, Guy M.; and Dorme, Nicole A. M.,3,655,762.
Blardinelli, Albert J.: *See—*
Salyer, Ival O.; and Blardinelli, Albert J.,3,655,815.
Blaser, Eric: *See—*
Shih, I-Kao; and Blaser, Eric,3,655,329.
Blatter, Herbert Morton: *See—*
Krug, Hans-Dietrich; Lucas, Robert Armistead; Blatter, Herbert Morton; Lucas, Robert Armistead; and Blatter, Herbert Morton,3,655,840.
Lucas, Robert Armistead; and Blatter, Herbert Morton,3,655,895.
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Block, Lester W. Adjustable swim and sun suit panty garment. 3,654,630, Cl. 2-67.
Blok, Petrus; and Viersma, Taco Jan. Equipment for aiding cardiovascular circulation. 3,654,918, Cl. 128-33.
Bloom, Carl, to Worthington Corporation. Multistage liquid and gas separator. 3,654,748, Cl. 55-322.
Bloom, John A.; Spruill, Durward L.; and Wakefield, Gene F., to Texas Instruments, Incorporated. Apparatus for forming a refractory coating on the inner periphery of a tubular object. 3,654,895, Cl. 118-48.
Bloomquist, Arnold Eugene: *See—*
Slagel, Robert Clayton; and Bloomquist, Arnold Eugene,3,654,994.
Blossom, Raymond W.; and Charkey, Allen, to Yardney International Corporation. Method of making an alkaline impregnated electrode. 3,655,451, Cl. 136-126.
Blumenthal, Jack Herbert: *See—*
Mitchell, Peter W. D.; and Blumenthal, Jack Herbert,3,655,722.
Blumenthal, John, to Clevite Corporation. Liquid toner clean-off system for high speed operation. 3,654,659, Cl. 15-306.
Boag, Alexander: *See—*
Bader, Henry; and Boag, Alexander,3,655,764.
Bock, Helmuth Joachim: *See—*
Gerke, Peter; Rutkowski, Karl; and Bock, Helmuth Joachim,3,655,922.
Bockstie, Lawrence G., Jr., to Corning Glass Works. Flame-resistant resistor coatings. 3,655,607, Cl. 260-33.8
Bode, Wolfgang W.; Dunlap, Glenn H.; Kobylak, Anthony M.; Richards, Raymond S.; and Pfaender, Lawrence V., to Owens-Illinois, Inc. Method of making gas discharge device. 3,654,680, Cl. 29-25.16
Boehringer Ingelheim G.m.b.H.: *See—*
Becher, Heinz-Manfred; and Sehring, Richard, 3,655,717.
Nickl, Josef; Engel, Wolfhard; Eckenfels, Albrecht; Seeger, Ernst; and Engelhardt, Gunther, 3,655,743.
Reuter, Wolfgang; Kutter, Eberhard; Sauter, Robert; Machleidt, Hans; and Wildfeuer, Alexander, 3,655,685.

Boeing Company, The: *See—*
Worden, John R.; and Kratzke, Albert W., 3,654,809.
Boeker, Justin R.: *See—*
Bastone, Andrew L.; Boeker, Justin R.; and Klimpl, Fred E.,3,655,468.
Bohar, Joseph: *See—*
Klopach, Robert T.; Bohar, Joseph; Klopach, Robert T.; Bohar, Joseph; Klopach, Robert T.; and Bohar, Joseph,3,656,166.
Bohrer, Thomas C.; and Champ, Antony E., to Celanese Corporation. Process for preparing acrylonitrile polymer solution. 3,655,857, Cl. 264-206.
Bolen, Hugh R., Jr.; and Wiggins, Charles S., to Magnetic Forming Corporation. Coupling for foldable bubular parts. 3,655,297, Cl. 416-72.
Bollettieri, Jerome; and Dalen, Arne, deceased0 (by Dalen, June; administratrix). Double bend stave. 3,655,211, Cl. 280-11.13
Bollinger, Pietro; Harri, Eugen; and Sigg, Hans-Peter, to Sandoz Ltd., a/k/a Sandoz AG. Antibiotic SL 3238 and process for the production of same. 3,655,880, Cl. 424-122.
Bonavita, Jean Baptiste, to British Petroleum Company Limited, The. Recovery of micro-organisms cultivated on hydrocarbons. 3,655,511, Cl. 195-28.
Bondit Corporation: *See—*
Goldstein, Milton; Hair, George R.; Kutzenco, Jack; and Marchand, Jacques J., 3,655,488.
Bonn, Clifford; and Wilson, Kenneth R. A., to Irvin Air Chute, Limited. Stretch fabric parachute canopy. 3,655,152, Cl. 244-145.
Bonnabaud, Joannes Francis Marcel; and Brat, Claude. Strand unreeling device with automatic tension control. 3,655,108, Cl. 242-128.
Bonzano, Giorgio, to Honeywell Information Systems Italia S.p.A. Apparatus for controlling the feeding of paper in high-speed printers. 3,656,041, Cl. 318-318.
Booman, Keith A.: *See—*
Dupre, Jean; and Booman, Keith A.,3,655,582.
Booth, Jack J.; and Branch, William C. Mixing dispenser. 3,655,097, Cl. 222-129.4
Boothe Airside Systems, Inc.: *See—*
Eggert, Walter S., Jr.; and Franz, Christian E., 3,654,653.
Bopp, Cecil W., to Go Corporation, Inc. Hydraulic cylinder apparatus. 3,655,315, Cl. 425-145.
Borg-Warner Corporation: *See—*
Hamm, John R., 3,654,950.
Roberts, Richard W., 3,654,707.
Yarema, Raymond J.; and Studtmann, George H., 3,656,047.
Borner, Peter: *See—*
Imoehl, Wolfgang; and Borner, Peter,3,655,617.
Bornet, Daniel: *See—*
Laser, Georges; and Bornet, Daniel,3,656,077.
Borrel, Philippe; and Lehureau, Jean, to Progil. Process of manufacturing stratified materials of glass fibers and polyesters using ultra-violet irradiation. 3,655,483, Cl. 156-272.
Bosch, Robert, G.m.b.H.: *See—*
Sturmer, Hans, 3,655,304.
Willhaus, Werner; and Scharf, Friedrich, 3,655,084.
Bosley, Denis V.: *See—*
Beny, Janos; Bosley, Denis V.; and Kennedy, Melvin R.,3,654,728.
Bosnalijek: *See—*
Tandara, Milan, 3,655,748.
Bossen, David A., to Industrial Nucleonics Corporation. Measuring water drainage rate from wet stock on a fourdrinier screen using radiation source and detectors. 3,655,980, Cl. 250-83.3
Bossinger, Charles D.; and Enkoji, Takashi, to Armour Pharmaceutical Company. Pharmaceutical preparations and methods of using same. 3,655,892, Cl. 424-249.
Botefuhr, Harold R.: *See—*
Jacyno, Anthony; and Botefuhr, Harold R.,3,656,016.
Bouchard, Jean; Frison, Roger; and Treille, Pierre, to Degremont, Societe Generale d'Epuration et d'Assainissement. Methods and devices for the regeneration of ion exchangers. 3,655,587, Cl. 260-2.1
Boucheron, Bernard, to Societe Eth Ylene Plastique. Thiirane copolymers. 3,655,634, Cl. 260-79.
Bourke, Robert F.; and Simons, Jon W., to Allis, Louis, Company, The. Tolerable voltage control circuit. 3,656,006, Cl. 307-252.
Bowen, Howard; Henderson, David L.; and Wallace, Richard R., to Harwald Company, Inc., The. Item scheduling system and apparatus therefor. 3,655,945, Cl. 235-61.1
Bowles, Harry L. Cyclone incinerator. 3,654,881, Cl. 110-8.
Bowman, James L.: *See—*
Bresee, Heber J.; and Bowman, James L.,3,656,031.
Bown, Delos E.: *See—*
Schultz, Henry G.; Williams, Herschel C.; Neureiter, Norman P.; and Bown, Delos E.,3,655,718.
Box, Theodor. High-impact plastic carrying and stacking case with hinged cover. 3,655,088, Cl. 220-29.000
Boyer, Lyndon D.; Coldiron, Arnold L.; and Wong, Soon Y., to Continental Oil Company. Process for producing free halogen from hydrogen halide and utilizing the free halogen in halogenation reactions. 3,655,801, Cl. 260-671.
BP Chemicals (U.K.) Limited: *See—*
Evans, Edward Michael; and Jeffreys, Kerry David, 3,655,609.
Bradshaw, Arthur; and Meadows, Frank William, to Service (Engineers) Limited. Clay-ware shaping machine with adjustable tool supporting means. 3,655,319, Cl. 425-267.
Brady, Lynn J., to CTS Corporition. Electrical resistance elements, their composition and method of manufacture. 3,655,440, Cl. 117-227.
Braemer, Frank C.: *See—*
Brown, Bernard C.; and Braemer, Frank C.,3,655,361.
Braggard, Adolphe Andre, to Centre National de Recherches Metallurgiques. Coating metallic materials. 3,655,428, Cl. 117-106.
Braggard, Adolphe Andre: *See—*
Hodgins, Howard A.; Braggard, Adolphe Andre; and Hodgins, Howard A.,3,655,028.
Brak, Stephen B.; Steves, Clarence; and Mayfield, Ross M., deceased0 (by Mayfield, Georgia P.; sole heir), to United States of America, Atomic Energy Commission. Drawbench. 3,654,794, Cl. 72-285.
Branch, William C.: *See—*
Booth, Jack J.; and Branch, William C.,3,655,097.
Brandt, Hans-Walther; Engelhard, Bruno; Steude, Heinrich; Scherb, Helmut; Schleppinghoff, Bernhard; and Schnuchel, Gunther, to Farbenfabriken Bayer Aktiengesellschaft, and Erdolschemie Gesellschaft mit beschrankter Haftung. $C_3$-Hydrocarbon mixtures subjected to liquid- liquid extractions and extractive distillation using plural solvent systems. 3,655,806, Cl. 260-681.5
Brannon, Ralph O.: *See—*
Medawar, George E.; Linderman, Duane L.; and Brannon, Ralph O.,3,655,133.
Brat, Claude: *See—*
Bonnabaud, Joannes Francis Marcel; and Brat, Claude,3,655,108.
Brathen, Kare: *See—*
Aas, Saebjorn; and Brathen, Kare,3,654,891.
Brauer, Hans, to Kieserling, Th., & Albrecht. Swaging machine. 3,654,789, Cl. 72-76.
Brault, Albert T.; and Bissonette, Vernon L., to Eastman Kodak Company. Processes for converting zero - valent metals photographic images to formazan dye images. 3,655,382, Cl. 96-48.
Braun, Arthur Rechtman, to Bell Telephone Laboratories, Incorporated. Crystal filter. 3,656,180, Cl. 333-71.
Braun, Fred, Sr. Toilet bowl structure. 3,654,641, Cl. 4-257.
Braunschweigische Maschinenbauanstalt: *See—*
Sommer, Harald, 3,655,124.
Brendle, Thomas A., to Audn Corporation. Recording and indicating system particularly for locomotives and the like. 3,655,955, Cl. 235-151.31
Bresee, Heber J.; and Bowman, James L., to Tektronix, Inc. Low noise field effect transistor with channel having subsurface portion of high conductivity. 3,656,031, Cl. 317-235.
Breuers, Theo Pierre Cretien, to Van Der Grinten N.V. Photocopying machine. 3,655,287, Cl. 355-97.
Brewer, Cecil G.: *See—*
Turner, David, 3,655,114.
Brickner, Kenneth G.; and Ratz, George A., to United States Steel Corporation. Method for producing minimum-ridging type 430 Mo stainless steel sheet and strip. 3,655,459, Cl. 148-12.
Briggs, Benjamin R.: *See—*
Robinson, Ronald A.; and Briggs, Benjamin R.,3,655,566.
Briles Manufacturing: *See—*
Mead, Daniel R., 3,654,792.
Briody, Robert G.; and Newyear, Edward G., to PPG Industries, Inc. Synthesis of tetramethyllead. 3,655,706, Cl. 260-437.
Bristol-Myers Company: *See—*
Granatek, Alphonse Peter; Granatek, Edmund Stanley; and Ratto, Peter Angelo, 3,655,883.
British Petroleum Company Limited, The: *See—*
Bonavita, Jean Baptiste, 3,655,511.
British Steel Corporation: *See—*
Robinson, Robert W., 3,655,989.
Brook, Richard G. Electrical safety device. 3,656,083, Cl. 339-39.
Brooker, Leslie G. S.: *See—*
Fumia, Arthur, Jr.; and Brooker, Leslie G. S.,3,655,392.
Brooks, James R.: *See—*
Harcourt, David N.; and Brooks, James R.,3,655,651.
Broughton, Eugene F. Pack of game playing ticket. 3,655,198, Cl. 273-139.
Brower, David F., to Gulf Oil Corporation. Electromagnetic forming apparatus. 3,654,787, Cl. 72-56.
Brown, Bernard C.; and Braemer, Frank C., to Chemical Construction Corporation. Controlled removal of off-gas from oxygen steel converters. 3,655,361, Cl. 75-60.
Brown, Fred, to Union Tank Car Company. Liquid level detector. 3,656,134, Cl. 340-244.
Brown, George A.; and Hinds, Francis Michael. Pipe line cleaner and sealer. 3,655,122, Cl. 239-226.
Brown, James L.; Himebaugh, Donald T.; and Montgomery, James R., to Mallinckrodt Chemical Works. Radiation-shielding receptacle for a bottle for receiving a radioactive eluate. 3,655,985, Cl. 250-108.
Brown, Manuel. Hair prosthesis for a bald head and a method of making it and a method of securing it. 3,654,935, Cl. 132-5.
Browne, Frank L.: *See—*
Philibert, Robert A.; and Browne, Frank L.,3,655,907.
Brownlee, John: *See—*
Price, Richard Thompson; Bauer, Stuart Michael; Brownlee, John; and Goberde, Bastiaan Cornelis,3,655,838.
Bruce, Ross William, Jr., to RCA Corporation. Corona generating circuits for electro- photographic printers cooperatively operating with television receivers. 3,655,912, Cl. 178-6.6
Brudner, Harvey J., to Westinghouse Learning Corporation. Com-

puter-assisted instruction via video-telephone. 3,654,708, Cl. 35-9.

Brumbelow, Joseph S. Remote monitor system. 3,656,132, Cl. 340-189.

Brumlik, George C. Method of producing a self-gripping fastening filament. 3,655,855, Cl. 264-147.

Brunnee, Kurt; and Kramer, Feodor Otto, to Varian Mat GmbH. Device for controlling the slit width of adjustable slit electrodes in mass spectrometers. 3,655,963, Cl. 250-41.9

Brunswick Corporation: *See—*
Gautraud, Michael G.; and Sanders, James W., 3,655,202.

Brunswick Corporation, The: *See—*
Gretzky, Anthony J., 3,655,203.

Bryant, Richard W.; and Tu, George K., to Cogar Corporation. Read/write system and circuit for semiconductor memories. 3,656,118, Cl. 340-173.

Buban, Elmer E.: *See—*
Cotabish, Harry N.; Wise, Layton A.; and Buban, Elmer E.,3,655,346.

Buchan, William R., to Itek Corporation. Variable electro-optic element. 3,655,266, Cl. 350-150.000

Buchanan, Jack M., to Hercules Incorporated. Process for preparing conjugate filaments. 3,655,859, Cl. 264-234.

Buchel, Karl H.; Regel, Erik; and Plempel, Manfred, to Farbenfabriken Bayer Aktiengesellschaft. N-Trityl-imidazoles for treating fungal infections. 3,655,899, Cl. 424-273.

Buchel, Karl H.; Regel, Erik; and Plempel, Manfred, to Farbenfabriken Bayer Aktiengesellschaft. N-Trityl-imidazoles for treating fungal infections. 3,655,900, Cl. 424-273.

Buckles, Donald N.: *See—*
Burgess, Warren C., Jr.; and Buckles, Donald N.,3,654,650.

Buckley, Frank Cyril, to Ciba Geigy AG. Process of producing salicylaldehyde. 3,655,770, Cl. 260-600.

Bucklin, Edward P., Jr.; Evans, Pat E.; and Gerlach, Richard K., to National Cash Register Company, The. Disc random access memory system. 3,656,130, Cl. 340-174.1

Budnowski, Manfred: *See—*
Saran, Herbert; and Budnowski, Manfred,3,655,624.

Bues, Jean Pierre: *See—*
Soviche, Gilles Andre Paul; Bues, Jean Pierre; Pavlin, Cyrille Francois; and Mace, Edouard Maurice Eugene Aime,3,654,945.

Buffleb, Herbert; Franck, Heinz Gerhard; Oberkobusch, Rudolf; Turowski, Johannes; Collin, Gerd; and Zander, Maximilian, to Rutgerswerke Aktiengesellschaft. Process for obtaining crude anthracene from mixtures containing phenanthrene, anthracene and their homologs. 3,655,802, Cl. 260-672.

Bullar, Ivan R.; and Bullar, Ivan R. Wedge clamping device for cable Wedge clamping device for cable. 3,654,672, Cl. 24-136.

Bunker-Ramo Corporation: *See—*
Belcher, Richmond D.; Duggan, Robert J.; Ellis, George R.; Esslinger, Robert H.; Goodyear, W. Frederick; Marshall, Joseph C.; and Masone, Thomas R., 3,656,148.

Bunker-Ramo Corporation, The: *See—*
Foerster, Roy P., 3,656,115.

Burgess & Associates, Inc.: *See—*
Burgess, Warren C., Jr.; and Buckles, Donald N., 3,654,650.

Burgess, Warren C., Jr.; and Buckles, Donald N., to Burgess & Associates, Inc. Automatic assembly apparatus. 3,654,650, Cl. 10-155.

Burkhardt, Max: *See—*
Meier, Walter; Burkhardt, Max; and Thalmann, Armin,3,654,989.

Burndy Corporation: *See—*
De Luca, Carlo Bruno; and Mallanik, Allan, 3,656,057.

Burns, Simon Pierce, to Jefferson Chemical Company, Inc. Chlorinated benzene production. 3,655,784, Cl. 260-650.

Burroughs Corporation: *See—*
Berry, Jack; and Luo, Zong-Shyong, 3,654,816.
Hepner, Neal, 3,655,309.

Burstrom, Martin; and Nilsson, Jan, to Almanna Svenska Elektriska Aktiebolaget. Hydrostatic extrusion of compound material. 3,654,687, Cl. 29-421.

Burton Instrumentation, Inc.: *See—*
Burton, Jay E., 3,656,160.

Burton, Jay E., to Burton Instrumentation, Inc. Downed-aircraft radio locator-beacon employing plural loop antennas. 3,656,160, Cl. 343--702

Burton, Robert, to Avery Products Corporation. Label imprinting and applying machine and method. 3,655,492, Cl. 156-541.

Busby, Llewellyn D.: *See—*
Davidson, William E.; and Busby, Llewellyn D.,3,654,715.

Bush, Richard Paul; and Thomas, Bryan, to Midland Silicones Limited. Preparation of cyclic nitrogen-containing organosilicon compounds. 3,655,711, Cl. 260-448.2

Bush, Richard P.; and Thomas, Bryan. Compounds containing silicon and nitrogen. 3,655,615, Cl. 260-46.5

Bushin, Leonid Mikhailovich: *See—*
Artamonova, Nadezhda Ivanovna; Bushin, Leonid Mikhailovich; Besedin, Leonid Nikolaevich; Zhurenko, Anna Timofeevna; Urvantsev, Leonid Mikhailovich; Scherbakov, Jury Dmitrievich; Yasjukevich, Boris Ivanovich; Demin, Anatoly Anisimovich; and Peshkov, Evgeny Viktorovich,3,654,756.

Busick, Richard Cobbold; and Masucci, Eugene Daniel, to Bell Telephone Laboratories, Incorporated. Electronic route translator. 3,655,921, Cl. 179-918.

Busse, Rido: *See—*
Kind, Guntram; Schroder, Karl-Heinz; and Busse, Rido,3,655,039.

Buzzell, Harold O., to Polaroid Corporation. I.D. card laminar structures and processes for making same. 3,655,494, Cl. 161-5.

Bysink, Alexandr Moiseevich: *See—*
Ostrovsky, Grigory Arkadievich; Orlovsky, Anatoly Georgievich; Nikonov, Vladimir Filippovich; Kalner, Veniamin Davydovich; Shklyarov, Isaak Nokhimovich; Stepin, Anatoly Loginovich; Bysink, Alexandr Moiseevich; Shepelyakovsky, Konstantin Zakharovich; and Smirnov, Stanislav Ivanovich,3,655,466.

Cahn, Robert L. Conveyor apparatus for individual supports. 3,655,031, Cl. 198-138.

Calgon Corporation: *See—*
Flock, Howard George, Jr.; and Rausch, Emerson George, 3,655,552.
Slagel, Robert Clayton; and Bloomquist, Arnold Eugene, 3,654,994.

Califoam Corporation of America: *See—*
Gentile, Carlos A., 3,654,735.

California and Hawaiian Sugar Company: *See—*
Schwer, Frederick W.; and Kean, Chester E., 3,655,442.

California Institute of Technology: *See—*
Rembaum, Alan, 3,655,814.

Camilleri, Francis P. Fish line holder. 3,654,722, Cl. 43-25.

Campbell, Charles S., to American Maize Products Company. Process for making a battermix starch for breaded deep fried foods. 3,655,443, Cl. 127-70.

Campbell, Jay E., to Fairview Development Service, mesne. Simulated leaded stained glass. 3,655,493, Cl. 161-905.

Campbell, Patrick J. Radiation emission and detective apparatus for determining density of a material. 3,655,977, Cl. 250-83.6

Campbell, Paul R. Method of and means for controlling traffic. 3,656,099, Cl. 340-62.

Capital Machine Company, Inc.: *See—*
Koss, Louis J., 3,654,973.

Carabateas, Philip M., to Sterling Drug Inc. N-(N-Heteryl)-acylanilides. 3,655,675, Cl. 260-293.74

Carberry, John L.; Carson, David C., Sr.; and Harrington, Edward F., to Chemetron Corporation. Multi-ply bellows structure with fluid previous spacer. 3,655,224, Cl. 285-93.

Carder, Frank B.; Stumpe, Warren R.; Frassetto, Bruno S.; and Bell, Charles H., to Dorr-Oliver, Incorporated. Cargo handling. 3,655,075, Cl. 214-38.

Carder, Frank B.; Stumpe, Warren R.; Frassetto, Bruno S.; and Bell, Charles H., to Dorr-Oliver, Incorporated. Cargo handling. 3,655,076, Cl. 214-38.

Cardic Machine Products, Inc.: *See—*
Bates, Leonard E., 3,654,662.

Carduck, Franz Josef: *See—*
Dorschner, Oskar; Carduck, Franz Josef; Storkebaum, Christoph; and Rother, Claus,3,655,862.

Carlson, Carl O.; Bernstein, Herbert L.; Franco, Albert J.; Carlson, Carl O.; Bernstein, Herbert L.; Franco, Albert J.; Carlson, Carl O.; Bernstein, Herbert L.; and Franco, Albert J., to National Cash Register Company, The National Cash Register Company, The. Semiconductor diode laser recorder Semiconductor diode laser recorder. 3,656,175, Cl. 346-76.

Carlson, Gordon A.: *See—*
Mitchell, Robert F.; and Carlson, Gordon A.,3,655,344.

Carlson, Ronald H., to Hooker Chemical Corporation. Synergistic metal sequestrant. 3,655,573, Cl. 252-180.

Carlsson, Per Arvid Emil; Corrodi, Hans Rudolf; Hallhagen, Sven Goran; and Junggren, Ulf Krister, to Aktiebolaget Hassle. 1-(3-Hydroxy-4-methyl-phenyl)-propylamine (-2) and the salts thereof. 3,655,737, Cl. 260-501.17

Carmichael, Paul D.: *See—*
Pogonowski, Ivo C.; and Carmichael, Paul D.,3,654,951.

Carnevale, Richard J.; Howe, Leland D., Jr.; Metz, Thomas A.; Womack, Karl K.; and Zurla, Frank A., to International Business Machines Corporation. Microprogrammed processor with variable basic machine cycle lengths. 3,656,123, Cl. 340-172.5

Carreira, Leonard M.; and Tulagin, Vsevolod, to Xerox Corporation. Photoelectrophoretic image transfer. 3,655,370, Cl. 96-1.3

Carrell, Harvey A. Ornamental artificial Christmas tree. 3,655,495, Cl. 161-16.

Carroll, Hazen J., to Carroll Packaging, Incorporated. Corner protector. 3,655,113, Cl. 229-14.

Carroll Packaging, Incorporated: *See—*
Carroll, Hazen J., 3,655,113.

Carson, David C., Sr.: *See—*
Carberry, John L.; Carson, David C., Sr.; and Harrington, Edward F.,3,655,224.

Cascade Corporation: *See—*
Sifri, Elie C.; and Shibahara, Matthew, 3,654,834.

Casio Computer Kabushiki Kaisha: *See—*
Kashio, Toshio; and Kashio, Toshio, 3,656,169.

Castello, Robert A.: *See—*
Morgans, David J.; Bavitz, Joseph F.; and Castello, Robert A.,3,655,742.

Castles, George Richard: *See—*
Ettre, Kitty S.; and Castles, George Richard,3,655,496.

Castro Convertibles Corporation: *See—*
Barabas, John J., 3,654,642.

Caterpillar Tractor Company: *See—*
Schexnayder, Lawrence F., 3,654,836.

Catoni, Mario: *See—*

Ronzoni, Isidoro; Catoni, Mario; and Chini, Pier Lodovico,3,655,829.
Cavagnero, Erman V.; and Loftus, Joseph F., to Torrington Manufacturing Company, The. Four-slide machine for producing bearings and the like. 3,654,693, Cl. 29-564.
Cavey, Richard R., to United States of America, Navy. Terrain avoidance system for a towed underwater vehicle. 3,656,095, Cl. 340-3.
Cavin, Lewis Fred, to Raymond International, Inc. Method of forming a composite pile. 3,654,767, Cl. 61-53.64
Celanese Corporation: *See—*
Bohrer, Thomas C.; and Champ, Antony E., 3,655,857.
Celmer, Walter D.: *See—*
Sciavolino, Frank C.; Routien, John B.; Tynan, Edward J.; and Celmer, Walter D.,3,655,876.
Celotex Corporation, The: *See—*
Medica, Joseph J.; Trout, Kenneth G.; and Kyminas, Stanley C., 3,655,594.
Centre Electronique Horloger S. A.: *See—*
Nikles, Francois; and Oguey, Henri T., 3,656,033.
Centre National de Recherches Metallurgiques: *See—*
Braggard, Adolphe Andre, 3,655,428.
Hodgins, Howard A.; Braggard, Adolphe Andre; and Hodgins, Howard A., 3,655,028.
Ceramic Magnetics, Inc.: *See—*
Lang, Alphonse Gregory, Jr., 3,655,923.
Certain-Teed Saint Gobain Insulation Corporation: *See—*
Waksman, David, 3,654,966.
Chadwick-Halmuth Electronics, Inc.: *See—*
Helmuth, James G., 3,654,804.
Chafaris, George J., to General Electric Company. Method and apparatus for reproducing optical information. 3,655,371, Cl. 96-1.1
Champ, Antony E.: *See—*
Bohrer, Thomas C.; and Champ, Antony E.,3,655,857.
Chandler, Jasper S., to Eastman Kodak Company. Method of making high brightness reflection screens. 3,655,472, Cl. 156-156.
Chang, Charles H.; and Randall, David I., to GAF Corporation. Naphthyl and anthracenyl butenyl sulfones. 3,655,772, Cl. 260-607.
Chang, William Shen Chie, to Bell Telephone Laboratories, Incorporated. Deflection of electromagnetic beams from guides by acoustical surface waves. 3,655,261, Cl. 350-96.
Chao, Tai S.; and Roush, Allan N., to Atlantic Richfield Company. Stable synthetic ester lubricant composition. 3,655,562, Cl. 252-51.5
Chapman, John H., to Georgia Kaolin Company. Clay processing. 3,655,417, Cl. 106-288.
Charier-Vadrot, Pierre L. J. Aromatic substances obtained from animal or vegetable tissues. 3,655,408, Cl. 99-140.
Charkey, Allen: *See—*
Blossom, Raymond W.; and Charkey, Allen,3,655,451.
Charron, John R. E. Fishing lure. 3,654,724, Cl. 43-42.06
Chatelain, Jean, to Produits Chimiques Pechiney-Saint Gobain. Expansible pearls containing ethyl-ethylene, propylene, and $SO_3$ groups in a copolymer and processes of making them. 3,655,592, Cl. 260-2.5
Chatterji, Arun K.: *See—*
Palermiti, Frank M.; and Chatterji, Arun K.,3,655,374.
Chauvin, Yves; Lefebvre, Gilles; and Uchino, Masahiro, to Institut Francais du Petrole des Carburants et Lubrifiants. Process for dimerizing and codimerizing olefins. 3,655,810, Cl. 260-683.15
Chemed Corporation: *See—*
Crotty, Homer E.; Coffey, Charles R.; and Tesdahl, Thomas C., 3,655,579.
Ritzi, Jack, 3,654,940.
Chemetron Corporation: *See—*
Carberry, John L.; Carson, David C., Sr.; and Harrington, Edward F., 3,655,224.
Madsen, Ditlev P.; and Pikel, John H., 3,655,702.
Chemfilt Corporation of America: *See—*
Martin, Joseph F., 3,654,934.
Chemical Construction Corporation: *See—*
Brown, Bernard C.; and Braemer, Frank C., 3,655,361.
Shah, Indravadan S., 3,655,338.
Chemische Werke Huels A.G.: *See—*
Strache, Hanns; and Dammermann, Rolf, 3,655,794.
Chemogro Corporation: *See—*
Gier, Delta W.; and Wasleski, Daniel M., 3,655,893.
Chen, Chung-Ho, to Sperry Rand Corporation. Non-linear transmission line current driver. 3,656,009, Cl. 307-268.
Chen, Chung-Ho; and Thomas, Roy D., to Sperry Rand Corporation. Sense amplifier for computer memory operating under high speed cycle times. 3,656,003, Cl. 307-238.
Chernow, Gary Allen; and Gail, Hyman, to Computer Test Corporation. Magnetic memory element testing system and method. 3,655,959, Cl. 235-153.
Chevron Research Company: *See—*
Csicsery, Sigmund M.; and Mulaskey, Bernard F., 3,655,798.
Kohn, Gustave K., 3,655,778.
Kohn, Gustave K.; and Stevick, Lawrence E., 3,655,780.
Lindquist, Robert H., 3,655,360.
Singer, Malcolm Scott, 3,655,689.
Straus, Alan E., 3,655,572.
Chiavaroli, Henry T.: *See—*
Abreu, Christian O.; Bernhard, John S.; and Chiavaroli, Henry T.,3,654,654.
Chicago Bridge & Iron Company: *See—*
Rothrock, Elmer Weyman; and Niku, Silvio D., 3,655,090.
Chicurel, Enrique J. Spherical drive vehicle. 3,655,005, Cl. 180-7.
Chiku, Takewo, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Heating a sintered alumina article in atmosphere containing sodium or potassium ions. 3,655,845, Cl. 264-82.
Childs, William V., to Phillips Petroleum Company. Sludge removal from electrochemical cell. 3,655,525, Cl. 204-1.
Childs, William V., to Phillips Petroleum Company. Treated porous anode for electrochemical fluorination. 3,655,548, Cl. 204-284.
Chini, Pier Lodovico: *See—*
Ronzoni, Isidoro; Catoni, Mario; and Chini, Pier Lodovico,3,655,829.
Chloupek, Frank J.: *See—*
Sherman, Paul David; and Chloupek, Frank J.,3,655,704.
Christenson, Roger M.: *See—*
Parker, Earl E.; Christenson, Roger M.; and Dowbenko, Rostyslaw,3,655,823.
Christian, Gary Dale, to Miles Laboratories, Inc. Potentiometric titration process. 3,655,526, Cl. 204-1.
Chung, Seng Fang; Kuechler, William L.; Steinbronn, George J.; Chung, Seng Fang; Kuechler, William L.; Steinbronn, George J.; Chung, Seng Fang; Kuechler, William L.; and Steinbronn, George J., to Proctor & Schwartz, Inc. Proctor & Schwartz, Inc. Method and apparatus for formulating fabric patterns Method and apparatus for formulating fabric patterns Method and apparatus for formulating fabric patterns. 3,656,177, Cl. 444-1.
Ciba Corporation: *See—*
Krug, Hans-Dietrich; Lucas, Robert Armistead; Blatter, Herbert Morton; Lucas, Robert Armistead; and Blatter, Herbert Morton, 3,655,840.
Lucas, Robert Armistead; and Blatter, Herbert Morton, 3,655,895.
Mueller, Guenther, 3,655,870.
Rossi, Alberto; Walter, Armin; Kessler, Werner; and Iselin, Beat, 3,655,884.
Ciba Geigy AG: *See—*
Buckley, Frank Cyril, 3,655,770.
Ulrich, Paul; and Frey, Christoph, 3,655,638.
Ciba Limited: *See—*
Lohse, Friedrich; Schmid, Rolf; Fisch, Willy; and Batzer, Hans, 3,655,817.
Nikles, Erwin, 3,655,730.
Piller, Bernhard, 3,655,388.
Seitz, Karl; Klahre, Guenter; and Riat, Henri, 3,655,662.
Ciba-Geigy AG: *See—*
Hamilton, Alexander, 3,655,641.
Meindl, Hubert; Ackermann, Hans; and Von Kaenel, Fred, 3,655,665.
Riat, Henri; and Oesterein, Fritz, 3,655,639.
Ciba-Geigy Corporation: *See—*
Holt, Brian, 3,655,559.
Spivack, John Denon, 3,655,614.
Cich, Everett Roy, to ESB Incorporated. Button cell battery. 3,655,452, Cl. 136-111.
Circle, Robert Ray, to Westinghouse Electric Corporation. Synchronously-operating circuit breaker with improved circuit breaker operating mechanism. 3,655,931, Cl. 200-148.
Cissell, W. M., Manufacturing Company, The: *See—*
Richterkessing, Frank H., 3,655,131.
Cities Service Company: *See—*
Rushton, George L., 3,655,828.
Cities Service Oil Company: *See—*
Jamieson, Ernest J., 3,655,351.
Rakow, Marvin S.; and Lockwood, William H., Jr., 3,655,807.
Citizen Watch Co., Ltd.: *See—*
Takamune, Hirotoki, 3,654,757.
Clanan, Wayne N. Invalid lift-transfer chair. 3,654,643, Cl. 5-81.
Clasen, Hermann, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Process for the production of naphthalenesulfonic acid in a packed reactor. 3,655,739, Cl. 260-500.
Clayton, John B., III, to American Standard, Inc. Freeze protection for outdoor cooler. 3,654,988, Cl. 165-17.
Claytor, Richard N.; and Eden, Dayton D., to Advanced Technology Center, Inc. Holography with thermochromic recording materials. 3,655,256, Cl. 350-3.5
Clearman, Jack F., to Whirlpool Corporation. Ice maker construction. 3,654,770, Cl. 62-320.
Clero, Guy: *See—*
Collet, Pierre Daniel; and Clero, Guy,3,655,387.
Clevite Corporation: *See—*
Blumenthal, John, 3,654,659.
Clifford, Joseph: *See—*
Tabares, Gilbert; and Clifford, Joseph,3,655,932.
Cline, Harvey E.: *See—*
Walter, John L.; Cline, Harvey E.; and Cobine, James D.,3,655,368.
Clinton, William P.: *See—*
Parliment, Thomas H.; Clinton, William P.; Scarpellino, Richard; Soukup, Robert J.; and Epstein, Martin F.,3,655,397.
Cobine, James D.: *See—*

Walter, John L.; Cline, Harvey E.; and Cobine, James D.,3,655,368.
Coffey, Charles R.: *See—*
Crotty, Homer E.; Coffey, Charles R.; and Tesdahl, Thomas C.,3,655,579.
Cogar Corporation: *See—*
Bryant, Richard W.; and Tu, George K., 3,656,118.
Cohen, Herbert. Electric variable tone percussion instrument. 3,655,904, Cl. 84-1.01
Cohn, Peter J.: *See—*
Schildkraut, Sid I.; Yates, Albert L.; and Cohn, Peter J.,3,655,482.
Coldiron, Arnold L.: *See—*
Boyer, Lyndon D.; Coldiron, Arnold L.; and Wong, Soon Y.,3,655,801.
Cole, John M., to Thomas & Betts Corporation. Method of making thin plated wire memory. 3,654,697, Cl. 29-604.
Cole, John M., to Rival Manufacturing Company. Method of making thin plated wire memory. 3,654,698, Cl. 29-604.
Coleman, Wesley B. Trot line guide device for boats. 3,654,721, Cl. 43-6.5
Colgate-Palmolive Company: *See—*
Gray, Frederick William, 3,655,567.
McGeary, George Jerome, 3,654,743.
Murphy, Lawrence J., 3,655,865.
Suh, John T.; and Schnettler, Richard A., 3,655,671.
Collet, Pierre Daniel; and Clero, Guy, to Eastman Kodak Company. Antistatic photographic compositions. 3,655,387, Cl. 96-87.
Collin, Gerd: *See—*
Buffleb, Herbert; Franck, Heinz Gerhard; Oberkobusch, Rudolf; Turowski, Johannes; Collin, Gerd; and Zander, Maximilian,3,655,802.
Columbia Broadcasting System, Inc.: *See—*
Goldberg, Abraham A.; and McMann, Renville H., Jr., 3,655,908.
Combustion Engineering, Inc.: *See—*
Bevilacqua, Frank; and Runde, Herbert A., 3,656,074.
Combustion Power Company, Inc.: *See—*
Smith, Richard D.; and Furlong, Dale A., 3,654,705.
Commercial Solvents Corporation: *See—*
Runge, Wallace F.; and Laine, Robert E., 3,655,781.
Commissariat A l'Energie Atomique: *See—*
Icre, Pierre; and Laizier, Jacques, 3,655,965.
Teboul, Albert, 3,654,970.
Compagnie de Saint-Gobain: *See—*
Tissier, Pierre, 3,655,355.
Compagnie Generale d'Entreprises Electriques: *See—*
Debaigt, Jean, 3,656,086.
Compagnie Internationale pour l'Informatique: *See—*
Fouche, Yvon; and Dansac, Jean, 3,656,147.
Compur-Werk Gesellschaft mit beschrankter Haftung & Co.: *See—*
Fahlenberg, Paul; and Pross, Wilhelm, 3,654,845.
Computer Modem Corporation: *See—*
Arbuckle, Timothy; and Sullivan, Herbert, 3,656,108.
Computer Test Corporation: *See—*
Chernow, Gary Allen; and Gail, Hyman, 3,655,959.
Concast AG: *See—*
Meier, Walter; Burkhardt, Max; and Thalmann, Armin, 3,654,989.
Connelly, Laverne R., to Eaton Corporation. Rotary pump with pressure relief. 3,655,299, Cl. 417-310.
Connick, William J., Jr.; and Ellzey, Samuel E., Jr., to United States of America, Agriculture. Process for imparting a water-and oil-repellent emulsion finish for cellulosic materials. 3,655,435, Cl. 117-139.5
Connick, William J., Jr.: *See—*
Ellzey, Samuel E., Jr.; Connick, William J., Jr.; Reeves, Wilson A.; and Drake, George L., Jr.,3,655,413.
Constantine, Thomas T., to Fabric Research Laboratories. Method of producing shrink-stabilized composite fabrics. 3,655,474, Cl. 156-178.
Constellation Science and Technology Corporation : *See—*
Paull, Stephen, 3,656,112.
Container Corporation of America: *See—*
Tanner, Donald M., 3,655,116.
Continental Can Company, Inc.: *See—*
Aschberger, Anton A.; and Bartels, Herbert D., 3,654,810.
Galitz, Raymond F., 3,654,898.
Manizza, Guelfo A., 3,655,115.
Weiss, Arthur J., 3,655,117.
Continental Oil Company: *See—*
Boyer, Lyndon D.; Coldiron, Arnold L.; and Wong, Soon Y., 3,655,801.
Harwood, William H., 3,655,536.
Rickard, Robert S.; and Whitfill, Donald L., 3,655,358.
Willhite, Glen Paul; and Martin, William L., 3,654,691.
Zavodny, Alfred T., 3,656,067.
Contois, Lawrence E.; Merrill, Stewart H.; and Grau, George S., to Eastman Kodak Company. Charge-transfer complexes of dibenzofuran- formaldehyde or dibenzothiophene-formaldehyde resins as photoconductive materials. 3,655,378, Cl. 96-1.5
Controls Company of America: *See—*
Giwosky, Harry L., 3,654,954.
Conway, Patrick H., to Sperry Rand Corporation. Hamming distance and magnitude detector and comparator. 3,656,109, Cl. 340-146.2
Cook Electric Company: *See—*
Patel, Vinayak K., 3,655,484.
Cook, Kenneth L.; and Mc Cartney, Thomas R., to Uhrden, Inc. Refuse packer. 3,654,854, Cl. 100-52.
Cooke, Wilbur P. Remote control apparatus for motorized vehicles. 3,655,006, Cl. 180-77.
Cooley, Austin C., to Eastman Kodak Company. Recovery of color-forming couplers. 3,655,753, Cl. 260-559.
Coombs, Robert V.; and Galantay, Eugene E., to Sandoz-Wander, Inc.Aromatically-unsaturated 9α-methyl steroids. 3,655,652, Cl. 260-239.55
Coopersmith, Leo; and Woodman, Frank H., Jr., to Ives, H. B., Company, The. Door stop and holder. 3,655,228, Cl. 292-79.
Corelli, Olga V.: *See—*
Corelli, Robert; and Corelli, Olga V.,3,655,036.
Corelli, Robert; and Corelli, Olga V. Litter bags and dispenser combination. 3,655,036, Cl. 206-57.
Corman, James C.; and Kelly, Peter E., to General Electric Company. Heat pipe cooled capacitor. 3,656,035, Cl. 317-243.
Corning Glass Works: *See—*
Bockstie, Lawrence G., Jr., 3,655,607.
Douglas, George Albert; and Prokopec, James C., 3,655,027.
Corodex N.V.: *See—*
Adegeest, Marco, 3,655,047.
Corrodi, Hans Rudolf: *See—*
Carlsson, Per Arvid Emil; Corrodi, Hans Rudolf; Hallhagen, Sven Goran; and Junggren, Ulf Krister,3,655,737.
Costello, Bernard J., to Angus Engineering Company, Inc. Conveyor for fusing and heating systems. 3,655,173, Cl. 263-8.
Cotabish, Harry N.; Wise, Layton A.; and Buban, Elmer E., to Mine Safety Appliances Company. Emergency breathing apparatus. 3,655,346, Cl. 23-281.
Cotton, Robert B., to All American Industries, Inc. Energy absorbing rotary piston pump. 3,655,303, Cl. 418-61.
Coucoulas, Alexander, to Western Electric Company, Incorporated. Assembly including carrier for devices. 3,655,177, Cl. 269-1.
Coulomb, Jean Marie Louis: *See—*
Zaki, Wahib Nassif; Coulomb, Jean Marie Louis; and Lovgren, Peter,3,655,568.
Cowan, Lee R., to C.R.C. Industries. Bearing assembly. 3,655,226, Cl. 287-119.
Craddick, Eleanor M.: *See—*
Craddick, Elmer C.; and Craddick, Eleanor M.,3,654,713.
Craddick, Elmer C.; and Craddick, Eleanor M. Ditch digging machine disk auger attachment. 3,654,713, Cl. 37-80.
Craig, Dwin R., to Ingenuics, Inc. Gravity operated liquid prism. 3,655,274, Cl. 350-286.
Crane, Charles V., to C&S Security Devices Inc. Credit card associated apparatus for personnel identification. 3,656,110, Cl. 340-149.
Crane Co.: *See—*
Dehne, Hans D., 3,654,815.
Cranston, Lawrence: *See—*
Atwell, William J.; and Cranston, Lawrence,3,654,967.
Crate-Rite, Incorporated: *See—*
Becklin, Dennis M., 3,655,215.
Crawford, James J.: *See—*
Frezzolini, James; and Crawford, James J.,3,656,045.
C.R.C. Industries: *See—*
Cowan, Lee R., 3,655,226.
Creagh, Linda Truitt. Electro-optical display devices using nematic mixtures with very wide temperature ranges. 3,655,270, Cl. 350-160.
Crecelius, William J., to SKF Industries, Inc. Support means for mounting a bearing assembly. 3,655,252, Cl. 308-236.
Cremer, Joseph: *See—*
Kribbe, Kurt Willi Harri,3,655,334.
Crescentini, Lamberto, to Allied Chemical Corporation. Polyamide filaments containing polyalkylene ethers and phenolic antioxidants. 3,655,819, Cl. 260-857.
Crisman, Marilou; and Howard, Arthur G. Disposable bib. 3,654,629, Cl. 2-49.
Croce, Louis J.; Bajars, Laimonis; and Gabliks, Maigonis, to Petro-Tex Chemical Corporation. Dehydrogenation process. 3,655,805, Cl. 260-680.
Cronin, Leo J., to Spectra-Mat, Inc. Thermionic cathode comprising mixture of barium oxide, calcium oxide and lithium oxide. 3,656,020, Cl. 313-346.
Cross, A. T., Company: *See—*
Curry, James E., 3,655,062.
Crotty, Homer E.; Coffey, Charles R.; and Tesdahl, Thomas C., to Chemed Corporation. Powder gelling composition. 3,655,579, Cl. 252-316.
Crown Zellerbach Corporation: *See—*
Stanley, Hugh E.; and Tokos, George M., 3,655,503.
Cruden, John L., Jr. Piped opening for use in a garment. 3,654,635, Cl. 2-266.
Crutchfield, William Gayle. Skull tongs. 3,654,923, Cl. 128-84.
Cryotan, Inc.: *See—*
Trenner, Lew, 3,655,086.
C&S Security Devices Inc.: *See—*
Crane, Charles V., 3,656,110.
Cseri, Joseph: *See—*
Glasser, George; and Cseri, Joseph,3,655,409.

Cseri, Joseph; Halik, Joseph John; and Kaplow, Milton, to General Foods Corporation. Production of shelf stable rehydratable rice. 3,655,400, Cl. 99-80.

Csicsery, Sigmund M.; and Mulaskey, Bernard F., to Chevron Research Company. Catalytic isomerization process. 3,655,798, Cl. 260-668.

C.T. & R.E., Inc.: *See*—
Young, Edward G., 3,655,444.

CTS Corporition: *See*—
Brady, Lynn J., 3,655,440.

Cunningham, M. E., Company: *See*—
Speicher, Edwin W.; and Fry, Charles E., Jr., 3,654,860.

Curran, Robert Kyran; Kerwin, Robert Eugene,; and Shankoff, Theodore Arthur, to Bell Telephone Laboratories, Incorporated. Electrolytic printing using polyvinyl alcohol. 3,655,527, Cl. 204-2.

Curry, James E., to Cross, A. T., Company. Penholder assembly. 3,655,062, Cl. 211-69.6

Curry, Robert W., III, to General Electric Company. Ice maker. 3,654,772, Cl. 62-353.

Curtiss-Wright Corporation: *See*—
Hermes, Walter L.; and Jones, Charles, 3,655,302.

Cuscurida, Michael: *See*—
Moss, Philip H.; and Cuscurida, Michael,3,655,590.

Cutter Laboratories, Inc.: *See*—
Allen, Robert E.; Thompson, Charles R.; and Hidalgo, John, 3,655,680.

Cutter-Hammer, Inc.: *See*—
Greening, Donald J.; Kintner, Paul M.; and Strand, Sanford M., 3,655,950.

Dalen, Arne: *See*—
Bollettieri, Jerome; and Dalen, Arne,3,655,211.

Dalen, June: *See*—
Bollettieri, Jerome; and Dalen, Arne,3,655,211.

Dalton, Gerald J. Garbage bag holder. 3,655,157, Cl. 248-97.

Dalzell, Eugene W., Jr., to United States of America, Army, mesne. Bullet hole locator-resistance type. 3,656,056, Cl. 324-65.

Dammermann, Rolf: *See*—
Strache, Hanns; and Dammermann, Rolf,3,655,794.

Damon, Gerald D., to Eaton Corporation. Control assembly. 3,654,762, Cl. 60-53.

Danfoss A/S: *See*—
John, Claus, 3,656,081.
Petersen, Jorgen Hartvig, 3,655,205.

Danneels, Guy: *See*—
Leblond, Jean; Biet, Jean; and Danneels, Guy,3,654,828.

Dansac, Jean: *See*—
Fouche, Yvon; and Dansac, Jean,3,656,147.

Darre, Bernard J., to Ethyl Corporation. Production of carboxylic acid esters by reaction of sodium carboxylates with alkyl halides using certain glycols and ethers as diluents. 3,655,701, Cl. 260-410.9

Dart Industries, Inc.: *See*—
Frank, Bernard, 3,654,780.
Woodham, George W.; and Stuart, James L., 3,655,850.

DASA Corporation: *See*—
Libby, Richard L.; Moseley, Robin C.; Jehl, Thomas G.; Ruggirello, William A.; and Dunn, J. Stewart, 3,656,131.

Dathe, Christian, to Institut fur Silikon- und Fluorkarbonchemie. Process for preparing fluorine compound from organosilicon compounds by means of fluorides of the first to third main groups of the periodic system. 3,655,714, Cl. 260-448.2

Daugherty, Charles W.: *See*—
Funkhouser, Harold F.; and Daugherty, Charles W.,3,655,317.

Davidson, Emil, to Guild Molders, Inc. Pivotal connection for plastic product. 3,654,939, Cl. 132-88.7

Davidson, William E.; and Busby, Llewellyn D., to General Electric Company. Adjustable sprayer iron with temperature interlock. 3,654,715, Cl. 38-77.5

Davies, George Edward; Dukes, Michael; and Johnston, Thomas Paterson, to Imperial Chemical Industries Limited. Pharamaceutical compositions containing a sympathomimetic amine and a triazolopyrimidine derivative and methods of preventing bronchospasms. 3,655,896, Cl. 424-251.

Davies, Terence J., to Xerox Corporation. Electrostatic pigment filter. 3,655,550, Cl. 204-302.

Davis, Albert H. Pumps. 3,655,300, Cl. 417-397.

Davis, Francis A., Jr., to Paramount Packaging Corporation. Machine for making plastic bags. 3,654,841, Cl. 93-33.

Davis, Parke & Company: *See*—
Rietman, Harry J., 3,654,926.

Davis, Steven Jay: *See*—
Liberman, Richard Allen; and Davis, Steven Jay,3,655,915.

Davis, Wayne Edward, to Johns-Manville Irrigation Corporation. Transient protection for electrical irrigation control systems. 3,656,024, Cl. 317-20.

Dawbarn, Henry D., to Thiokol Chemical Corporation. Tufted pile fabric. 3,654,884, Cl. 112-410.

Dawley, Richard H.: *See*—
Larson, Clarence E.; and Dawley, Richard H.,3,655,104.

Dean, Peter Mervyn: *See*—
Sear, Reginald; and Dean, Peter Mervyn,3,655,973.

Dear, Robert E. A.: *See*—
Gilbert, Everett E.; and Dear, Robert E. A.,3,655,786.

Debaigt, Jean, to Compagnie Generale d'Entreprises Electriques. Modular electrical connector assembly. 3,656,086, Cl. 339-92.

Debbas, Samir Costandi: *See*—
Baxter, James Fletcher; and Debbas, Samir Costandi,3,655,305.

Decalock Limited: *See*—
Armstrong, Richard James, 3,655,230.

Dechenaux, Victor Louis: *See*—
Gerbier, Gerard Marcel; and Dechenaux, Victor Louis,3,655,446.

Deeds, Douglas; and Rosengrant, Barry L., to Architectural Fiberglass, Inc. Article of furniture. 3,655,253, Cl. 312-194.

Deering Milliken Research Corporation: *See*—
Rollins, William H., 3,655,327.
Warthen, William P., 3,655,141.

Degremont, Societe Generale d'Epuration et d'Assainissement:*See*—
Bouchard, Jean; Frison, Roger; and Treille, Pierre, 3,655,587.

De Groot, John E., to Benfur Engineering Company. Blade-retention system for a blasting machine. 3,654,736, Cl. 51-9.

Dehm, Henry C.; and Mellow, Dale F., to Hercules Incorporated. Process for preparation of molded propellant charges from smokeless powder and nonvolatile binders. 3,655,836, Cl. 264-3.

Dehne, Hans D., to Crane Co. Mechanical gear drive. 3,654,815, Cl. 74-410.

Deisenroth, Robert J., to Excel Corporation. Method of bedding panels into frames. 3,655,854, Cl. 264-134.

DeKlerk, John, to Westinghouse Electric Corporation. Method of forming thin insulating films particularly for piezoelectric transducers. 3,655,429, Cl. 117-106.

Delalande S.A.: *See*—
Fauran, Claude P.; Raynaud, Guy M.; Oliver, Rene A.; and Douzon, Colette A., 3,655,687.
Gautier, Jean A.; Miocque, Marcel Y.; Moskowitz, Henri; Blanc-Guenee, Janine L.; Raynaud, Guy M.; and Dorme, Nicole A. M., 3,655,762.

Delamere & Williams Company Limited: *See*—
Bateman, Lawrence Giles, 3,655,072.

Delaney, John F., to Anaconda Company, The. Separation of molybdenium sulfide from copper sulfide with depressants. 3,655,044, Cl. 209-167.

Del Gaudio, Italo, to Texas Instruments, Incorporated. Method of making an electronic module. 3,654,695, Cl. 29-593.

Del Mar Engineering Laboratories: *See*—
Sanctuary, Clifford, 3,654,915.

De Loach, Herman Holmes, to Bell Telephone Laboratories, Incorporated. Microwave stripline phase adjuster. 3,656,179, Cl. 333-31.

De Luca, Carlo Bruno; and Mallanik, Allan, to Burndy Corporation. Safety terminator with testing and pulling means. 3,656,057, Cl. 324-133.

Dema Engineering Co.: *See*—
McDougall, Franklin M., 3,655,296.

DeMaine, Paul A. D.; and Springer, Gordon K., to Research Corporation. Data compression and decompression system. 3,656,178, Cl. 444-1.

Demin, Anatoly Anisimovich: *See*—
Artamonova, Nadezhda Ivanovna; Bushin, Leonid Mikhailovich; Besedin, Leonid Nikolaevich; Zhurenko, Anna Timofeevna; Urvantsev, Leonid Mikhailovich; Scherbakov, Jury Dmitrievich; Yasjukevich, Boris Ivanovich; Demin, Anatoly Anisimovich; and Peshkov, Evgeny Viktorovich,3,654,756.

Dentsply International Inc.: *See*—
Schaun, Wolfgang Eugene, 3,655,941.

DePalma, James J., to Eastman Kodak Company. Rear projection screen. 3,655,262, Cl. 350-126.

De Paul, Robert Allen, to International Nickel Company, Inc., The. Low alloy structural steel. 3,655,366, Cl. 75-123.

De Porras, Jaime Molinae: *See*—
Martinez-Alvarez, Francisco; Ruiz, Ricardo Garcia; De Porras, Jaime Molinae; Merino Del Rio, Jose Luis; and Bertsch, Walter,3,655,789.

deRooij, Abraham H.; and Elemndorp, Jan, to Stamicarbon, N.V. Cyclic process for the preparation of an oxime from a hydroxylammonium salt solution. 3,655,760, Cl. 260-566.

Derringer, Ray; and Faehling, Francis L., to Preway Inc. Gas-burning wall fireplace. 3,654,913, Cl. 126-121.

De Santis, Ermenegildo, to Industrie Pirelli S.p.A., mesne. Annular structures reinforced with textile elements, in particular, rubbing elements for carding machines. 3,654,813, Cl. 74-232.

Deskey, Donald Stephen. Angle of attack indicating system. 3,654,807, Cl. 73-180.

DeSoto, Inc.: *See*—
Sekmakas, Kazys, 3,655,602.

Deutsche Advance Produktion G.m.b.H.: *See*—
Eggensperger, Heinz; Franzen, Volker; and Stephan, Hans, 3,655,833.
Lorenz, Hans Joachim; and Sander, Hans-Jurgen, 3,655,816.

De Voe, Albert W. Process and apparatus for the combustion firing of asphalt, petroleum and pulverized coal. 3,655,128, Cl. 239-98.

De Wald, Raymond C., to Firestone Tire & Rubber Company, The. Process for grafting polymeric vinyl and vinylidene chloride sidechains to polyols and fluid dispersion compositions. 3,655,553, Cl. 252-1.

Dey, Arabinda N.; and Sullivan, Bernard P., to Mallory, P. R., & Co., Inc. Method of preparing cathodic electrodes. 3,655,585, Cl. 252-506.

De Young, Edwin L., to Universal Oil Products Company. Dimerization of diolefinic compounds. 3,655,791, Cl. 260-666.

Diamond Alkali Company: *See—*
Sellet, Lucien, 3,655,619.
Diamond Shamrock Corporation: *See—*
Schoendorfer, George F.; Morschhauser, Roger J.; Gardner, Thomas S.; and Thompson, Donald L., 3,655,539.
Dickinson, Becton and Company: *See—*
Holderith, William J., 3,654,925.
Diebold, Incorporated: *See—*
Terrell, William H., 3,655,153.
Diecomp Inc.: *See—*
Levine, Richard C., 3,655,917.
Diehl, Byron C.: *See—*
Norton, Charles J.; and Diehl, Byron C.,3,655,736.
Dienner, John A. Therapeutic device for arthritis. 3,654,917, Cl. 128-26.
Dierdorff, Lee H., Jr.; and Kosciolek, Joseph H., to FMC Corporation. Epoxidation of soybean oil. 3,655,698, Cl. 260-348.5
Diesel Kiki Kabushiki Kaisha: *See—*
Jingu, Tomoyasu; and Yamamoto, Tokio, 3,654,776.
Dietrich, Werner: *See—*
Wingler, Frank; Dietrich, Werner; Bartl, Herbert; and Kraft, Karl-Josef,3,655,589.
Dietz, R. E., Co.: *See—*
Steltzer, Ernest R.; and Nitsch, Edward J., 3,656,105.
Diffenderfer, Walter L.: *See—*
Mc Farland, Frederick R.; and Diffenderfer, Walter L.,3,654,686.
Digilio, Frank Anthony, to RCA Corporation. Motion transfer mechanism. 3,655,126, Cl. 234-115.
Dijkstra, Rinse; and Van Diepen, Cornelis Bernardus, to U.S. Philips Corporation. Method of coating the surfaces of electrically conducting and semiconducting materials with an electrically insulating polymeric film by means of electrolysis. 3,655,543, Cl. 204-181.
Dillon, Janus J., to Food Equipment, Inc. Shackle cleaning system. 3,654,941, Cl. 134-59.
Dischler, Helmut, to Becorit Grubenausbau GmbH. Press assembly. 3,654,799, Cl. 72-454.
Ditonto, Alexander N.; and Lindros, Charles J., to AVM Corporation. Voting machine. 3,655,125, Cl. 235-54.
Diversified Designs Services: *See—*
Berkus, Clyde C., 3,654,850.
Diversified Industries Inc.: *See—*
Wallace, George O., 3,654,870.
Dixon, Norman E., to United States of America, Atomic Energy Commission. Method of generating unipolar and bipolar pulses. 3,656,012, Cl. 310-8.1
Dixon, Samuel J.: *See—*
Srivastava, Keshava; and Dixon, Samuel J.,3,656,149.
Dockery, Calvin D.: *See—*
Young, Richard K.; and Dockery, Calvin D.,3,655,848.
Doering, George I., to Industrial Nucleonics Corporation. Frequency standardized penetrating radiation gauge. 3,655,976, Cl. 250-83.3
Dole Valve Company, The: *See—*
Jones, William H.; and Hamilton, Martin W., 3,655,002.
Domenico, Italo Di, to Qualitrol Corporation. Temperature responsive circuit control instrument. 3,656,078, Cl. 337-70.
Donaldson, George W., to Westinghouse Air Brake Company. Car propulsion scheme utilizing married pairs of propulsion units. 3,656,037, Cl. 318-59.
Donohue, James M.; and Gerbasi, Dennis P., to Xerox Corporation. Toner reclaiming system. 3,654,901, Cl. 118-637.
Dorme, Nicole A. M.: *See—*
Gautier, Jean A.; Miocque, Marcel Y.; Moskowitz, Henri; Blanc-Guenee, Janine L.; Raynaud, Guy M.; and Dorme, Nicole A. M.,3,655,762.
Dorn, Chester, to Superior Manufacturing Company. Plunger assembly for hand grease guns. 3,655,101, Cl. 222-326.
Dorr-Oliver, Incorporated: *See—*
Carder, Frank B.; Stumpe, Warren R.; Frassetto, Bruno S.; and Bell, Charles H., 3,655,075.
Carder, Frank B.; Stumpe, Warren R.; Frassetto, Bruno S.; and Bell, Charles H., 3,655,076.
Dorschner, Oskar; Carduck, Franz Josef; Storkebaum, Christoph; and Rother, Claus, to Metallgesellschaft AG. Aspirator jet for drawing-off filaments. 3,655,862, Cl. 264-290.
Dougan, Ernest V., to Hunt-Wesson Foods, Inc. Combined food pastry and filling. 3,655,402, Cl. 99-86.
Douglas, George Albert; and Prokopec, James C., to Corning Glass Works. Unscrambler for light bulb traying machine. 3,655,027, Cl. 198-33.
Douzon, Colette A.: *See—*
Fauran, Claude P.; Raynaud, Guy M.; Oliver, Rene A.; and Douzon, Colette A.,3,655,687.
Dow Chemical Company, The: *See—*
Baggett, Joseph M., 3,655,506.
Guilmette, F. Peter; and Madison, Norman L., 3,655,733.
Reifschneider, Walter, 3,655,773.
Seeburger, Harold O.; and Horsley, Lee H., 3,655,522.
Seeburger, Harold O.; and Horsley, Lee H., 3,655,523.
Sherger, Vernon A.; and Kramer, Walter R., 3,655,333.
Taylor, Otis C., 3,655,342.
Wang, Chun-Shan; and Easterly, James P., 3,655,678.
Dow Corning Corporation: *See—*
Antonen, Robert C.; and Kookootsedes, Gust J., 3,655,598.
Bachura, Richard A., 3,655,581.
Le Grow, Gary E., 3,655,713.
Saam, John C., 3,655,633.
Dowbenko, Rostyslaw: *See—*
Parker, Earl E.; Christenson, Roger M.; and Dowbenko, Rostyslaw,3,655,823.
Downingtown Division Beloit Corporation: *See—*
Wallis, Robert L., 3,655,143.
Dowty Technical Developments Limited: *See—*
Harding, John Kammerer, 3,654,908.
Drake, George L., Jr.: *See—*
Ellzey, Samuel E., Jr.; Connick, William J., Jr.; Reeves, Wilson A.; and Drake, George L., Jr.,3,655,413.
Dravo Corporation: *See—*
Veith, Werner, 3,655,174.
Dresser Industries, Inc.: *See—*
Nelson, Dana W., 3,655,944.
Drinkard, William Charles, Jr., to Du Pont de Nemours, E. I., and Company. Hydrocyanation of olefins. 3,655,723, Cl. 260-465.3
Driscoll, Gary L., to Sun Oil Company. Preparation of oils from isobutene. 3,655,808, Cl. 260-683.15
Driscoll, Patrick R., to Mobil Oil Corporation. 3-Thiadiazolyltetrahydro-1,3,5-oxadiazin-4-ones. 3,655,659, Cl. 260-244.
Driscoll, Patrick R., to Mobil Oil Corporation. Use of pyridylthiuronium slats as fungicides. 3,655,898, Cl. 424-263.
DuBois, Bert, to Tenneco Inc. Acoustic conduit with wrinkle section. 3,655,010, Cl. 181-36.
Duchane, David V., to Kimberly-Clark Corporation. Flushable wrapper for absorbent pads. 3,654,928, Cl. 128-290.
Dudka, Viktor Vasilievich: *See—*
Portyanko, Andrei Ivanovich; Lastovenko, Valentin Andreevich; Dudka, Viktor Vasilievich; Rodenko, Fedor Leontievich; Onischenko, Grigory Ivanovich; Vatkin, Adolf Semenovich; Pokusa, Alexei Alexandrovich; and Ruzin, Ivan Mikhailovich,3,654,997.
Duffy, Francis M. Method and preparation for treatment of carcinoma. 3,655,873, Cl. 424-93.
Duffy, Michael C.; Schumann, Paul A., Jr.; and Yeh, Tsu-Hsing, to International Business Machines Corporation. Method of making or modifying a PN junction by ion implantation. 3,655,457, Cl. 148-1.5
Duggan, Robert J.: *See—*
Belcher, Richmond D.; Duggan, Robert J.; Ellis, George R.; Esslinger, Robert H.; Goodyear, W. Frederick; Marshall, Joseph C.; and Masone, Thomas R.,3,656,148.
Dukes, John R., to Industrial Nucleonics Corporation. Non-shifting radiation source capsule. 3,655,984, Cl. 250-106.
Dukes, Michael: *See—*
Davies, George Edward; Dukes, Michael; and Johnston, Thomas Paterson,3,655,896.
Dunlap, Glenn H.: *See—*
Bode, Wolfgang W.; Dunlap, Glenn H.; Kobylak, Anthony M.; Richards, Raymond S.; and Pfaender, Lawrence V.,3,654,680.
Dunlap, Howard L., to Hughes Aircraft Company. Method for bonding contacts to and forming alloy sites on silicon carbide. 3,654,694, Cl. 29-587.
Dunn, J. Stewart: *See—*
Libby, Richard L.; Moseley, Robin C.; Jehl, Thomas G.; Ruggirello, William A.; and Dunn, J. Stewart,3,656,131.
Dunn, Lloyd G., to Aluminum Company of America. Method and apparatus for stripping container bodies from a reciprocal mandrel. 3,654,796, Cl. 72-345.
Dunst, Robert A.: *See—*
Samuelson, Bruce E.; and Dunst, Robert A.,3,655,927.
Dupol-Rubbermaid GmbH Fabrik fur Gummi- und Kunststofferzeugnisse: *See—*
Hubel, Otto, 3,654,657.
Du Pont de Nemours, E. I., and Company: *See—*
Adams, John B., 3,655,657.
Baxter, James Fletcher; and Debbas, Samir Costandi, 3,655,305.
Bither, Tom Allen, Jr., 3,655,348.
Drinkard, William Charles, Jr., 3,655,723.
Finlay, Joseph B.; and Hagman, JOhn F., 3,655,827.
Gallup, Arthur R., 3,655,853.
Hawkins, William E., 3,655,307.
Lee, Kyu Tai; and Whitney, Joel G., 3,655,694.
Linn, William Joseph; and Stiles, Alvin Barber, 3,655,724.
Martin, Elmore L., 3,655,623.
Overman, Joseph De Witt, 3,655,390.
Pater, Richard, 3,655,664.
Rondestvedt, Christian Scriver, Jr., 3,655,732.
Strolle, Clifford H., 3,655,604.
Sullivan, David Lee, 3,655,795.
Tichenor, Robert L., 3,655,420.
Vasta, Joseph A., 3,655,610.
Woodell, Rudolph, 3,655,498.
Yates, Paul C., 3,655,578.
Zimmerman, Joseph, 3,655,630.
Dupre, Jean, to Rohm & Haas Company. Method of imparting soil release properties to fabrics. 3,655,436, Cl. 117-129.5
Dupre, Jean; and Booman, Keith A., to Rohm & Haas Company. Synergistic combination of silicates and barium salts for inhibiting the attack of alkaline solutions on aluminum containing materials. 3,655,582, Cl. 252-387.
Durametallic Corporation: *See—*
Adams, William V., 3,655,206.

Durand, Harry Walter, to Grain Processing Corporation. Derivatized starch thinning with hydrogen peroxide. 3,655,644, Cl. 260-233.3

Duren, Rainer; and Neidig, Klaus, to Volkswagenwerk Aktiengesellschaft. Guide lock for motor vehicles. 3,656,098, Cl. 340-52.

DuRocher, Gideon A.; and Kosowan, Michael B., to Essex International, Inc. Motor actuated seat back latch release mechanism. 3,655,240, Cl. 297-379.

Dvonch, William: *See—*
Alburn, Harvey E.; and Dvonch, William,3,655,725.

Dyke, Leslie Alexander, to Formmaster Limited. Stationery bonding apparatus. 3,655,491, Cl. 156-459.

Dynaflair Corporation Ltd.: *See—*
Labelle, Henri Marcel Robert, 3,654,982.

Dynamit Nobel Aktiengesellschaft: *See—*
Fuchs, Otto, 3,655,426.

Earle, Ernest L., Jr.: *See—*
Pitchon, Esra; and Earle, Ernest L., Jr.,3,655,399.

Easter, Ross A., to Pillsbury Company, The. Container for diluting and dispensing material. 3,655,096, Cl. 222-82.

Easterly, James P.: *See—*
Wang, Chun-Shan; and Easterly, James P.,3,655,678.

Eastman Kodak Company: *See—*
Brault, Albert T.; and Bissonette, Vernon L., 3,655,382.
Chandler, Jasper S., 3,655,472.
Collet, Pierre Daniel; and Clero, Guy, 3,655,387.
Contois, Lawrence E.; Merrill, Stewart H.; and Grau, George S., 3,655,378.
Cooley, Austin C., 3,655,753.
DePalma, James J., 3,655,262.
Fumia, Arthur, Jr.; and Brooker, Leslie G. S., 3,655,392.
Hampton, Robert W., 3,654,844.
Illingsworth, Bernard D., 3,655,394.
McGraw, Carl W., 3,655,407.
O'Brien, Robert J., 3,655,473.
Parsons, Timothy F., 3,655,380.
Piper, Douglas E.; Jarvis, James G.; and Smith, Dale L., 3,654,893.
Roemer, Whitelaw C., 3,655,381.
Van Lare, Earl J.; and Fumia, Arthur, Jr., 3,655,393.

Eaton Corporation: *See—*
Achs, Horst J., 3,654,876.
Connelly, Laverne R., 3,655,299.
Damon, Gerald D., 3,654,762.
Pipes, George R., 3,655,074.

Eaton Yale & Towne, Inc.: *See—*
Griffiths, Thomas C., 3,654,833.
Gruber, Thomas J.; and Lyth, William W., 3,656,140.

Ebergardt, Thomas; and Welch, William H., to Abbott Laboratories. Infant feeding unit assembly. 3,655,083, Cl. 215-11.

Eckenfels, Albrecht: *See—*
Nickl, Josef; Engel, Wolfhard; Eckenfels, Albrecht; Seeger, Ernst; and Engelhardt, Gunther,3,655,743.

Eco Pump Corporation: *See—*
Mitchell, William, 3,655,295.

Eden, Dayton D.: *See—*
Claytor, Richard N.; and Eden, Dayton D.,3,655,256.

Eder, Heinz: *See—*
Stoy, Franz; and Eder, Heinz,3,654,739.

Edo Corporation: *See—*
Schildkraut, Sid I.; Yates, Albert L.; and Cohn, Peter J., 3,655,482.

Edwards Company, Inc.: *See—*
Berns, Charles, 3,656,156.

Eggensperger, Heinz; Franzen, Volker; and Stephan, Hans, to Deutsche Advance Produktion G.m.b.H. Reaction products of phenol derivatives with phosphorous compounds. 3,655,833, Cl. 260-948.

Eggert, Walter S., Jr.; and Franz, Christian E., to Boothe Airside Systems, Inc., mesne. Probe apparatus. 3,654,653, Cl. 14-72.

Eguchi, Tamotsu: *See—*
Ohfuji, Yoshio; and Eguchi, Tamotsu,3,655,632.

Eickmann, Karl. Fluid handling device with radially variable working chambers. 3,654,761, Cl. 60-53.

EIS Automotive Corporation, The: *See—*
Schwarz, Maurice L., 3,654,689.

Eisenbach, Beatrice: *See—*
Eisenbach, Joachim,3,655,110.

Eisenbach, Joachim, deceased0 (by Eisenbach, Beatrice; administratrix), to Hinteregger, Peter, KG, Firma. Closure fastener for hinged packages made of deep drawn plastic foil. 3,655,110, Cl. 229-2.5

Eisfeld, Wolfgang: *See—*
Sturm, Hans Juergen; Armbrust, Herbert; Nienburg, Hans; and Eisfeld, Wolfgang, ,365,574.

Electro-Quimica de Flix S.A.: *See—*
Martinez-Alvarez, Francisco; Ruiz, Ricardo Garcia; De Porras, Jaime Molinae; Merino Del Rio, Jose Luis; and Bertsch, Walter, 3,655,789.

Electrodynamic Gravity, Inc.: *See—*
Hooper, William J., 3,656,013.

Electrohome Limited: *See—*
Remick, Cassius D., 3,654,747.

Electronic Image Systems Corporation: *See—*
Wernikoff, Robert E.; Perozek, David M.; and Roten, Jana M., 3,654,846.

Elemndorp, Jan: *See—*
deRooij, Abraham H.; and Elemndorp, Jan,3,655,760.

Elf, and Bertin & Cie: *See—*
Soviche, Gilles Andre Paul; Bues, Jean Pierre; Pavlin, Cyrille Francois; and Mace, Edouard Maurice Eugene Aime, 3,654,945.

Elitex, Zavody textilniho strojirenstvi: *See—*
Vach, Miroslav, 3,655,951.

Elliot, Ian R., to Rank Organisation Limited, The. Method of making continuous fibre bundle. 3,655,352, Cl. 65-4.

Elliott, George H.: *See—*
Roman, Leonard F.; and Elliott, George H.,3,655,903.

Elliott, Robert L., to TRW Inc. Forged piston with circumferential grain flow around upper region of wrist pin bore and method of producing same. 3,654,840, Cl. 92-222.

Ellis, George R.: *See—*
Belcher, Richmond D.; Duggan, Robert J.; Ellis, George R.; Esslinger, Robert H.; Goodyear, W. Frederick; Marshall, Joseph C.; and Masone, Thomas R.,3,656,148.

Ellmann, Norbert W.: *See—*
Wilson, Earl D.; and Ellmann, Norbert W.,3,654,924.

Ellzey, Samuel E., Jr.; Connick, William J., Jr.; Reeves, Wilson A.; and Drake, George L., Jr., to United States of America, Agriculture. Composition for rendering cellulosic fabrics water-and oil-repellent. 3,655,413, Cl. 106-2.

Ellzey, Samuel E., Jr.: *See—*
Connick, William J., Jr.; and Ellzey, Samuel E., Jr.,3,655,435.

Emanuelsson, Jan: *See—*
Hellsten, Martin; and Emanuelsson, Jan,3,655,569.

Energy Conversion Devices, Inc.: *See—*
Henisch, Heinz K., 3,656,032.
Ovshinsky, Stanford R., 3,654,864.

Engel, Elton D., to Ford Motor Company. Device for detecting and signaling a change of more than a prescribed amount in the rate of movement of an object. 3,655,928, Cl. 200-61.45

Engel, Elton D.; and Miller, Richard H., to Ford Motor Company. Device for detecting and signalling a change of more than a prescribed amount in the rate of movement of an object. 3,655,929, Cl. 200-61.45

Engel Industries, Inc.: *See—*
Werner, Fred C., Jr., 3,654,830.

Engel, Wolfhard: *See—*
Nickl, Josef; Engel, Wolfhard; Eckenfels, Albrecht; Seeger, Ernst; and Engelhardt, Gunther,3,655,743.

Engelhard, Bruno: *See—*
Brandt, Hans-Walther; Engelhard, Bruno; Steude, Heinrich; Scherb, Helmut; Schleppinghoff, Bernhard; and Schnuchel, Gunther,3,655,806.

Engelhard Minerals & Chemicals Corporation: *See—*
Mercade, Venancio V., 3,655,038.
Rylander, Paul N.; and Steele, Duane R., 3,655,777.

Engelhardt, Gunther: *See—*
Nickl, Josef; Engel, Wolfhard; Eckenfels, Albrecht; Seeger, Ernst; and Engelhardt, Gunther,3,655,743.

Engineered Data Products, Inc.: *See—*
Osojnak, Boris M., 3,654,878.

Englaender, Klaus: *See—*
Haberkorn, Erich J.; and Englaender, Klaus,3,655,150.

Enkoji, Takashi: *See—*
Bossinger, Charles D.; and Enkoji, Takashi,3,655,892.

Enterprise Machine and Development Corp.: *See—*
Hodgins, Howard A.; Braggard, Adolphe Andre; and Hodgins, Howard A., 3,655,028.

Enterprise Machine and Development Corporation: *See—*
Hodgins, Howard A.; Braggard, Adolphe Andre; and Hodgins, Howard A., 3,655,028.

Enthone, Incorporated: *See—*
Kampe, Marcis M., 3,655,534.

Entreprise de Recherches et d'Activites Petrolieres: *See—*
Soviche, Gilles Andre Paul; Bues, Jean Pierre; Pavlin, Cyrille Francois; and Mace, Edouard Maurice Eugene Aime, 3,654,945.

Epstein, Martin F.: *See—*
Parliment, Thomas H.; Clinton, William P.; Scarpellino, Richard; Soukup, Robert J.; and Epstein, Martin F.,3,655,397.

Erb, Edward R.; and Maass, Richard L., to GAF Corporation. Apparatus for making embossed foamed surface covering materials. 3,655,312, Cl. 425-115.

Erdolchemie Gesellschaft mit beschrankter Haftung: *See—*
Scherhag, Bernhard; and Hausweiler, Arnold, 3,655,519.

Erdolschemie Gesellschaft mit beschrankter Haftung: *See—*
Brandt, Hans-Walther; Engelhard, Bruno; Steude, Heinrich; Scherb, Helmut; Schleppinghoff, Bernhard; and Schnuchel, Gunther, 3,655,806.

Erpenbach, Heinz: *See—*
Sennewald, Kurt; Vogt, Wilhelm; Erpenbach, Heinz; and Glaser, Hermann,3,655,747.

Ervin, William D., to Aurora Equipment Company. Coil pickup device. 3,655,068, Cl. 214-1.

ESB Incorporated: *See—*
Cich, Everett Roy, 3,655,452.
Hamel, David O., 3,655,456.
Soto-Krebs, Luis A., 3,655,450.

Esch, Erika: *See—*
Staib, Armando, 3,654,920.
Essex International, Inc.: *See—*
DuRocher, Gideon A.; and Kosowan, Michael B., 3,655,240.
Lee, Paul R., 3,656,079.
Prouty, Robert E.; Gilman, John E., III; and Smith, James J., 3,656,076.
Esslinger, Robert H.: *See—*
Belcher, Richmond D.; Duggan, Robert J.; Ellis, George R.; Esslinger, Robert H.; Goodyear, W. Frederick; Marshall, Joseph C.; and Masone, Thomas R.,3,656,148.
Esso Research and Engineering Company: *See—*
Geyer, Jerome; Hu, Shih-En; and Robbins, Max L., 3,655,558.
Langer, Arthur W., Jr., 3,655,812.
Marsh, John F.; and Swietlik, Joseph M., 3,655,557.
Ott, Roy John; and Miller, Harold Nelson, 3,655,767.
Schultz, Henry G.; Williams, Herschel C.; Neureiter, Norman P.; and Bown, Delos E., 3,655,718.
Shelton, Marcus H.; and James, Ralph, Jr., 3,655,851.
Ethridge, Fredrick A.: *See—*
Binford, Jack C.; Ethridge, Fredrick A.; and Talbot, James R.,3,654,677.
Ethyl Corporation: *See—*
Darre, Bernard J., 3,655,701.
Harkins, Alvin E., Jr., 3,655,520.
Ettre, Kitty S.; and Castles, George Richard, to Vitta Corporation. Tape transfer to sinterable conductive, semiconductive or insulating patterns to electronic component substrates. 3,655,496, Cl. 161-39.
Evans, David J. I.; and Zubryckyj, Nicolas. Process for treating low-iron nickeliferous ores. 3,655,364, Cl. 75-103.
Evans, Edward Michael; and Jeffreys, Kerry David, to BP Chemicals (U.K.) Limited. Binder mixture for friction elements comprising phenolic resin and precipitated silicate. 3,655,609, Cl. 260-38.
Evans, Pat E.: *See—*
Bucklin, Edward P., Jr.; Evans, Pat E.; and Gerlach, Richard K.,3,656,130.
Evans, Robley D. Film badge radiation dosimeter for detecting radon. 3,655,975, Cl. 250-83.
Evenson, Christopher B. Elliptical roller bearing. 3,655,251, Cl. 308-183.
Eversman Mfg. Company, The: *See—*
Shader, Benjamin A., 3,654,998.
Excel Corporation: *See—*
Deisenroth, Robert J., 3,655,854.
Ezaki, Joichiro, to TDK Electronics Company, Ltd. Magnetic-core memory matrix. 3,656,129, Cl. 340-174.
Fabric Research Laboratories: *See—*
Constantine, Thomas T., 3,655,474.
Factory Mutual Research Corporation: *See—*
Livington, William L., 3,655,136.
Faehling, Francis L.: *See—*
Derringer, Ray; and Faehling, Francis L.,3,654,913.
Faelten, Carl R.: *See—*
Mosso, Paul R.; and Faelten, Carl R.,3,655,588.
Fahlenberg, Paul; and Pross, Wilhelm, to Compur-Werk Gesellschaft mit beschrankter Haftung & Co. Photographic shutter with electromagnetic drive means. 3,654,845, Cl. 95-53.
Fairview Development Service: *See—*
Campbell, Jay E., 3,655,493.
Falconer, David G. Measurement and control apparatus. 3,654,802, Cl. 73-37.5
Farah, Basil S.: *See—*
Hutzler, George J.; and Farah, Basil S.,3,655,627.
Farbenfabriken Bayer Aktiengesellschaft: *See—*
Becker, Gustav; Griepentrog, Heinz; Klebert, Wolfgang; and Reich, Friedrich, 3,655,437.
Brandt, Hans-Walther; Engelhard, Bruno; Steude, Heinrich; Scherb, Helmut; Schleppinghoff, Bernhard; and Schnuchel, Gunther, 3,655,806.
Buchel, Karl H.; Regel, Erik; and Plempel, Manfred, 3,655,899.
Buchel, Karl H.; Regel, Erik; and Plempel, Manfred, 3,655,900.
Fries, Ludwig; Mundil, Rudolf; and Wiechers, Herbert, 3,655,709.
Heine, Heinz, 3,655,336.
Kronig, Walter; and Grolig, Johann, 3,655,759.
Nickel, Horst; and Suckfull, Fritz, 3,655,740.
Oberkirch, Wolfgang; Gunther, Peter; and Pampus, Gottfried, 3,655,584.
Scherhag, Bernhard; and Hausweiler, Arnold, 3,655,519.
Schliebs, Reinhard, 3,655,835.
Wingler, Frank; Dietrich, Werner; Bartl, Herbert; and Kraft, Karl-Josef, 3,655,589.
Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning: *See—*
Clasen, Hermann, 3,655,739.
Frischkorn, Hans; Schinzel, Erich; and Rosch, Gunter, 3,655,574.
Groebel, Alfred; and Lindner, Ernst, 3,655,886.
Hoyer, Hans; Keil, Gunter; and Happe, Wilhelm, 3,655,844.
Kaupp, Josef, 3,655,820.
Meininger, Fritz; and Hunger, Kaus, 3,655,642.
Ottawa, Norbert; and Schafer, Gustav, 3,655,601.
Schoernig, Ludwig, 3,655,867.
Spietschka, Ernst; and Ische, Friedrich, 3,655,670.
Spietschka, Ernst; and Ische, Friedrich, 3,655,672.
Weber, Helmut; Weyer, Rudi; Aumuller, Walter; Muth, Karl; and Stach, Kurt, 3,655,756.
Faria, Sixdeniel; and Harrigan, David J., to Sylvania Electric Products, Inc. Zinc cadmium sulfide cathodluminescent screen. 3,655,978, Cl. 250-80.
Faria, Sixdeniel; and Williams, Lyle K., to Sylvania Electric Products, Inc. Cathodoluminescent phosphor compositions. 3,655,575, Cl. 252-301.6
Farkas, Robert D. Heat sealing apparatus. 3,655,487, Cl. 156-380.
Farnam, F. D., Co.: *See—*
Farnam, Robert G.; and Passarella, Michael T., 3,655,210.
Farnam, Robert G.; and Passarella, Michael T., to Farnam, F. D., Co. High torque retention heat insulative gasket structure. 3,655,210, Cl. 277-235.00b
Farrington Business Machines Corporation: *See—*
Strohschneider, Heinz F., 3,654,862.
Fastener Engineers, Inc.: *See—*
Alcock, Richard A.; Guthrie, Robert M.; and Johnston, Robert B., 3,654,784.
Fauber, Eugene M.; and Moyer, Hallard C., to Atlantic Richfield Company. Lubricating composition. 3,655,563, Cl. 252-59.
Faucci, Adriano: *See—*
Arni, Urs; Faucci, Adriano; and Stocker, August,3,655,721.
Fauran, Claude P.; Raynaud, Guy M.; Oliver, Rene A.; and Douzon, Colette A., to Delalande S.A. Derivatives of 5-hydroxymethyl-3-substituted-2- oxazolidinones, process of preparation thereof and therapeutic application. 3,655,687, Cl. 260-307.
Fayling, Richard E., to Minnesota Mining and Manufacturing Company. Magnetic electrical connector for a food preparation system. 3,654,853, Cl. 99-359.
Fearon, Joseph G., to Morrison-Knudsen, Company, Inc. Railway hopper car pivoted closure chute. 3,654,872, Cl. 105-239.
Federal-Mogul Corporation: *See—*
Reichman, Steven H., 3,655,458.
Feher, Mike B.: *See—*
Richeson, William E., Jr.; and Feher, Mike B.,3,656,151.
Fehling, Hans Richard: *See—*
Winkler, Hans-Joachim; and Fehling, Hans Richard,3,655,176.
Fellmann, Robert Paul; and Fettes, Robert Clarke, to Rohm & Haas Company. Acrylic elastomer impact modifier. 3,655,826, Cl. 260-876.
Fenton, Donald M., to Union Oil Company of California. Preparation of methacrylic acid. 3,655,745, Cl. 260-526.
Fenton, Donald M., to Union Oil Company of California. Preparation of N-N'-diaryl-1,4-diaminonaphthalene compound. 3,655,763, Cl. 260-576.
Ferdinand, Irwin J.; and Kulbersh, Irwin R., to Hirsh Company, The. Twist cam lock for knockdown shelving. 3,654,879, Cl. 108-110.
Ferguson, Otis B., to Recovery Systems Research, Inc. Rereefing parachute and aerial recovery system. 3,655,151, Cl. 244-142.
Fermionics, Inc.: *See—*
Trussell, Harry B., 3,655,046.
Fernald, Herbert B.; Gall, William; Gwynn, Bernard H.; and Ward, John V., to Gulf Research & Development Company. Conversion of ethylene to alpha olefins in the presence of a diisobutylene solvent. 3,655,809, Cl. 260-683.15
Fernseh G.m.b.H.: *See—*
Schneider, Hans-Dieter, 3,655,913.
Ferro Corporation: *See—*
Gobstein, Saul, 3,655,708.
Fettes, Robert Clarke: *See—*
Fellmann, Robert Paul; and Fettes, Robert Clarke,3,655,826.
Fetzer, Fred; and Miranda, Ronald P., to Bettcher Industries, Inc. Meat tenderizer. 3,654,664, Cl. 17-25.
Fiber Industries, Inc.: *See—*
Binford, Jack C.; Ethridge, Fredrick A.; and Talbot, James R., 3,654,677.
Fichtel & Sachs AG: *See—*
Lorcher, Harry; and Spreitzer, Franz, 3,655,017.
Fichter, Barry, to American Standard, Inc. Fluidic controlled refill system. 3,654,957, Cl. 137-596.14
Fielden, Roy; Green, Albert Lawrence; and Hills, Derek William, to Smith Kline & French Laboratories. 1-$\beta$-Hydroxy-$\beta$-phenylethylguanidine. 3,655,757, Cl. 260-564.
Fields, Joseph E.; and Johnson, John H., to Monsanto Company. Process for the separation of virus from non- viral proteins. 3,655,509, Cl. 195-1.5
Fields, Joseph E.: *See—*
Wharton, Ferdinand D.; Johnson, John H.; Fields, Joseph E.; and Machlin, Lawrence J.,3,655,869.
Fifer, Rolland L. Means for automatically operating sewage treatment units. 3,655,050, Cl. 210-86.
Fikes, Alan L.: *See—*
Freeze, James T.; and Fikes, Alan L.,3,655,616.
Fink, Hans-Ferdi; Koerner, Gotz; Rossmy, Gerd; and Schmidt, Gunter, to Goldschmidt, Th., A.-G. Fire extinguishing foams containing finely despersed silica. 3,655,554, Cl. 252-3.
Finkenzeller, Johann; and Schmidt, Artur. X-ray diagnostic device having a patient chair and an X-ray source whose relative orientation is constant. 3,655,967, Cl. 250-50.
Finlay, Joseph B.; and Hagman, JOhn F., to Du Pont de Nemours, E. I., and Company. Polychloroprene sol-gel blends. 3,655,827, Cl. 260-890.
Firestone, Alexander H.; Fisk, Robert W.; and Kennedy , Kurt D., to

Air Reduction Company, Incorporated. Heating system for electron beam furnace. 3,655,902, Cl. 13-31.

Firestone Tire & Rubber Company, The: *See—*
De Wald, Raymond C., 3,655,553.
Kay, Edward L.; and Beckman, Joseph A., 3,655,599.

Fisch, Willy: *See—*
Lohse, Friedrich; Schmid, Rolf; Fisch, Willy; and Batzer, Hans,3,655,817.

Fischer, Raymond C., to International Harvester Company. Implement carrier. 3,654,999, Cl. 172-311.

Fisher, Donald J.; and Severynse, Gerard T., to Xerox Corporation. Cleaning method for electrostatic copying machines. 3,655,373, Cl. 96-1.4

Fisher, Harold M.: *See—*
Mitchell, Maurice M., Jr.; Fisher, Harold M.; and Tomezsko, Edward S.,3,655,792.
Mitchell, Maurice M., Jr.; Fisher, Harold M.; and Tomezsko, Edward S.,3,655,800.

Fisk, Robert W.: *See—*
Firestone, Alexander H.; Fisk, Robert W.; and Kennedy , Kurt D.,3,655,902.

Fitzpatrick, James E.: *See—*
Poppe, Wassily; Khelghatian, Habet M.; and Fitzpatrick, James E.,3,655,433.

Fletcher, H. E., Co.: *See—*
Fletcher, Ralph A.; and Oliver, Joseph R., 3,655,243.

Fletcher, Ralph A.; and Oliver, Joseph R., to Fletcher, H. E., Co. Method and apparatus for working mineral bodies and other materials. 3,655,243, Cl. 299-15.

Flock, Howard George, Jr.; and Rausch, Emerson George, to Calgon Corporation. Method for removing phosphate from waste water. 3,655,552, Cl. 210-47.

Floehr, Walter L., to Midland-Ross Corporation. Tandem toggle hopper door operating mechanisms. 3,654,873, Cl. 105-248.

Fluidic Industries, Inc.: *See—*
Hatch, Richard W., Jr.; and Blaiklock, Paul M., 3,654,947.

FMC Corporation: *See—*
Dierdorff, Lee H., Jr.; and Kosciolek, Joseph H., 3,655,698.
Mednick, Sol Abraham, 3,655,524.
Treves, Gino R., 3,655,655.
Wilson, Kenneth R.; and Kennedy, Robert M., 3,655,696.

Foerster, Roy P., to Bunker-Ramo Corporation, The. Fusible link matrix for programmable networks. 3,656,115, Cl. 340-166.

Food Equipment, Inc.: *See—*
Dillon, Janus J., 3,654,941.

Foote Mineral Company: *See—*
Smith, William Novis, Jr., 3,655,332.

Ford Motor Company: *See—*
Engel, Elton D., 3,655,928.
Engel, Elton D.; and Miller, Richard H., 3,655,929.
Shachter, Moses; and Mikulin, Tom T., 3,654,820.

Forenta, Limited: *See—*
North, William L., 3,654,714.

Forkner, John H. Method of packaging two or more discrete foodstuffs. 3,655,410, Cl. 99-171.

Forlini, Matthew, to Research Frontiers, Inc. Light valves with high frequency excitation. 3,655,267, Cl. 350-150.

Formmaster Limited: *See—*
Dyke, Leslie Alexander, 3,655,491.

Forrer, Gilbert R., to Babcock & Wilcox Company, The. Apparatus for storing and exposing a radioactive source. 3,655,983, Cl. 250-106.

Forrest, Norman, to Tenneco Chemicals, Inc. Synthetic suede. 3,655,497, Cl. 161-62.

Fors, Juan Rovira. Panty type garment and method of knitting the same on a flat knitting machine. 3,654,779, Cl. 66-171.

Forsgren, Kiell Rudolf, to United Shoe Machinery Company AB. Means for sealing a joint, filling a space and the like. 3,655,213, Cl. 277-237.

Forster, Friedrich M. O. Leakage field flaw detector with current energization with means to control current energization by probe scan. 3,656,054, Cl. 324-37.

Forte, Peter W. Time delayed theft alarm for a carrying case. 3,656,144, Cl. 340-283.

Fouche, Yvon; and Dansac, Jean, to Compagnie Internationale pour l'Informatique. Symbol display system for messages received in signal form. 3,656,147, Cl. 340-324.

Fourniquet, Jean: *See—*
Beau, Raymond; and Fourniquet, Jean,3,655,580.

Fox, Homer M.: *See—*
Ruehlen, Forrest N.; and Fox, Homer M.,3,655,535.

Fraleigh, Alton L. Flexible barrier. 3,654,730, Cl. 49-34.

Franck, Heinz Gerhard: *See—*
Buffleb, Herbert; Franck, Heinz Gerhard; Oberkobusch, Rudolf; Turowski, Johannes; Collin, Gerd; and Zander, Maximilian,3,655,802.

Franco, Albert J.: *See—*
Carlson, Carl O.; Bernstein, Herbert L.; Franco, Albert J.; Carlson, Carl O.; Bernstein, Herbert L.; Franco, Albert J.; Carlson, Carl O.; Bernstein, Herbert L.; and Franco, Albert J.,3,656,175.

Frank, Bernard, to Dart Industries, Inc., mesne. Clothes steamer device. 3,654,780, Cl. 68-222.

Franklyn, Robert Alan. Cosmetic surgical process. 3,654,914, Cl. 128-1.

Franz, Christian E.: *See—*
Eggert, Walter S., Jr.; and Franz, Christian E.,3,654,653.

Franzen, Volker: *See—*
Eggensperger, Heinz; Franzen, Volker; and Stephan, Hans,3,655,833.

Fraser, James R.; and Jenkins, Victor F., to Laporte Industries Limited. Polymerisation process. 3,655,631, Cl. 260-78.3

Frassetto, Bruno S.: *See—*
Carder, Frank B.; Stumpe, Warren R.; Frassetto, Bruno S.; and Bell, Charles H.,3,655,075.
Carder, Frank B.; Stumpe, Warren R.; Frassetto, Bruno S.; and Bell, Charles H.,3,655,076.

Freber, Elmer C., to Marquette Tool and Die Company. Process for producing cup-shaped objects having axially extending lips. 3,654,795, Cl. 72-329.

Fredd, John V.; and Tamplen, Jack W., to Otis Engineering Corporation. Valves. 3,654,962, Cl. 137-625.11

Freeze, James T.; and Fikes, Alan L., to Pfizer Inc. Stabilized halogen containing resins. 3,655,616, Cl. 260-45.75

Freireich, Emil J.: *See—*
Judson, George T.; and Freireich, Emil J.,3,655,123.

Freudenberg, Carl: *See—*
Krug, Hans-Dietrich; Lucas, Robert Armistead; Blatter, Herbert Morton; Lucas, Robert Armistead; and Blatter, Herbert Morton, 3,655,840.

Frey, Albert M., to Powerdyne Inc. Multiple vacuum switch apparatus having longitudinal actuator. 3,655,930, Cl. 200-144.

Frey, Christoph: *See—*
Ulrich, Paul; and Frey, Christoph,3,655,638.

Frezzolini Electronics Inc.: *See—*
Frezzolini, James; and Crawford, James J., 3,656,045.

Frezzolini, James; and Crawford, James J., to Frezzolini Electronics Inc. Battery protection circuit. 3,656,045, Cl. 320-34.

Friebel, Heinz: *See—*
Wochnowski, Waldemar; and Friebel, Heinz,3,655,043.

Friederichs, Edgar E.: *See—*
Friederichs, Josef E.; Friederichs, Edgar E.; and Weg, Leo,3,655,052.

Friederichs, Josef E.; Friederichs, Edgar E.; and Weg, Leo, to Alpha Advanced Systems, Inc. Fluid contamination measuring system. 3,655,052, Cl. 210-90.

Friedman, Lester, to Weston Chemical Corporation. Pentaerythritol diphosphites. 3,655,831, Cl. 260-927.

Fries, Ludwig; Mundil, Rudolf; and Wiechers, Herbert, to Farbenfabriken Bayer Aktiengesellschaft. Process for the manufacture of arylchlorosilanes in accordance with the Rochow synthesis. 3,655,709, Cl. 260-448.2

Frischkorn, Hans; Schinzel, Erich; and Rosch, Gunter, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Optical brightening composition mixture of three analogous compounds. 3,655,374, Cl. 252-301.2

Frison, Roger: *See—*
Bouchard, Jean; Frison, Roger; and Treille, Pierre,3,655,587.

Fritz, Fred A., to Hercules Incorporated. Mach effect in presplitting. 3,654,866, Cl. 102-23.

Froio Corporation: *See—*
Froio, Nicholas J., 3,655,021.

Froio, Nicholas J., to Froio Corporation. Imbalanced braking device. 3,655,021, Cl. 193-35.

Frosst, Charles E., and Co.: *See—*
Wasson, Burton K., 3,655,661.

Fry, Charles E., Jr.: *See—*
Speicher, Edwin W.; and Fry, Charles E., Jr.,3,654,860.

Fuchs, Herbert A.: *See—*
Kasperik, Archibald S.; and Fuchs, Herbert A.,3,655,621.

Fuchs, Otto, to Dynamit Nobel Aktiengesellschaft. Process of coating metal with polyvinyl flouride and resultant product. 3,655,426, Cl. 117-75.

Fuji Photo Film Co., Ltd.: *See—*
Kumai, Akira; and Ogawa, Yasuhisa, 3,655,412.
Tamai, Tasuo, 3,654,865.
Tamai, Yasuo; Matsumoto, Seiji; and Honjo, Satoru, 3,655,419.
Yasuda, Yukio; Tsuji, Nobuo; and Miyazako, Takushi, 3,655,389.

Fujimoto, Keimei: *See—*
Kitamura, Shige Yoshi; Hirai, Hajime; Okuno, Yositosi; and Fujimoto, Keimei,3,655,654.

Fujioka, Akira: *See—*
Ichikawa, Kiyoshi; and Fujioka, Akira,3,656,133.

Fujitsu, Limited: *See—*
Kanda, Kaoru; and Kobayashi, Tadahiro, 3,656,125.

Fujiya Co., Ltd.: *See—*
Fukumoto, Shoichi, 3,654,808.

Fukumoto, Shoichi, to Fujiya Co., Ltd. Barometer. 3,654,808, Cl. 73-384.

Full Mold Process, Inc.: *See—*
Wittmoser, Adalbert; Schade, Johannes; and Krzyzanowski, Erich, 3,654,987.

Fulmer, George M.: *See—*
Lane, Frank B.; and Fulmer, George M.,3,655,214.

Fulton, Ronald T., to Panduit Corporation. Double-latch cable tie. 3,654,669, Cl. 24-16.

Fumia, Arthur, Jr.; and Brooker, Leslie G. S., to Eastman Kodak Company. Photographic silver halide emulsion sensitized with a methine dye. 3,655,392, Cl. 96-131.

Fumia, Arthur, Jr.: *See—*
Van Lare, Earl J.; and Fumia, Arthur, Jr.,3,655,393.
Funkhouser, Harold F.; and Daugherty, Charles W., to Baxter Laboratories, Inc. Automatic mold stripping machine. 3,655,317, Cl. 425-165.
Furlenmeiter, Andre: *See—*
Furst, Andor; Furlenmeiter, Andre; Langemann, Albert; Waldvogel, Guy; Hocks, Peter; Kerb, Ulrich; and Wiechert, Rudolf,3,655,650.
Furlong, Dale A.: *See—*
Smith, Richard D.; and Furlong, Dale A.,3,654,705.
Furst, Andor; Furlenmeiter, Andre; Langemann, Albert; Waldvogel, Guy; Hocks, Peter; Kerb, Ulrich; and Wiechert, Rudolf, to Hoffmann-La Roche Inc.Processes for the preparation of 5β-H-6-keto steroids. 3,655,650, Cl. 260-239.55
Furuichi, Masayoshi; Miyakawa, Seiichi; and Masuda, Nobuchika, to Katsuragawa Kenki Kabushiki Kaisha. Corona discharge device. 3,656,021, Cl. 317-4.
Furukawa, Hikaru: *See—*
Takeda, Ikuo; Suzuki, Takashi; and Furukawa, Hikaru,3,656,153.
Fussel, Rudi, to Olivetti, Ing., C., & C., S.p.A. Liquid development of electrostatic images. 3,656,173, Cl. 346-74.
Futterer, Bodo. Method of making a cutting foil or plate for shavers. 3,655,528, Cl. 204-11.
Futterer, Bodo. Electrodeposition process for producing perforated foils with raised portions at the edges of the holes. 3,655,529, Cl. 204-11.
Gabel, Floyd S. Powered cutter apparatus. 3,654,978, Cl. 146-98.
Gabliks, Maigonis: *See—*
Croce, Louis J.; Bajars, Laimonis; and Gabliks, Maigonis,3,655,805.
GAF Corporation: *See—*
Chang, Charles H.; and Randall, David I., 3,655,772.
Erb, Edward R.; and Maass, Richard L., 3,655,312.
Gail, Hyman: *See—*
Chernow, Gary Allen; and Gail, Hyman,3,655,959.
Galantay, Eugene E.: *See—*
Coombs, Robert V.; and Galantay, Eugene E.,3,655,652.
Galbraith-Pilot Marine Corporation: *See—*
Parke, Harry G., 3,656,046.
Galeano, Sergio F., to Owens-Illinois, Inc. Apparatus for oxidizing a spent pulping liquor. 3,655,343, Cl. 23-284.
Galitz, Raymond F., to Continental Can Company, Inc. Outside side-stripping device. 3,654,898, Cl. 118-323.
Gall, William: *See—*
Fernald, Herbert B.; Gall, William; Gwynn, Bernard H.; and Ward, John V.,3,655,809.
Gallup, Arthur R., to Du Pont de Nemours, E. I., and Company. Process for producing polytetrafluoroethylene filaments. 3,655,853, Cl. 264-127.
Garcia, Ralph. Hair trimming device. 3,654,699, Cl. 30-133.
Gardner, Thomas S.: *See—*
Schoendorfer, George F.; Morschhauser, Roger J.; Gardner, Thomas S.; and Thompson, Donald L.,3,655,539.
Garrett, Dennis J. Camper cycle carrier. 3,655,082, Cl. 214-450.
Gautier, Jean A.; Miocque, Marcel Y.; Moskowitz, Henri; Blanc-Guenee, Janine L.; Raynaud, Guy M.; and Dorme, Nicole A. M., to Delalande S.A. 9-Aminoalkyl-9-alkyl- or aryl- sulphonyl-fluorenes. 3,655,762, Cl. 260-570.8
Gautraud, Michael G.; and Sanders, James W., to Brunswick Corporation. Golf game. 3,655,202, Cl. 273-176.
Gay, William E. Tableware sorting system. 3,655,040, Cl. 209-75.
Gebruder Holler G.m.b.H.: *See—*
Holler, Hans, 3,655,180.
Geering, Emil J.: *See—*
Lin, Kingso C.; and Geering, Emil J.,3,655,423.
Gehrken, Hubert; Helms, Gerd; Keunecke, Gerhard; and Krimphove, Herbert, to Zieren, A., Dr., Chemiebau GmbH and Co., KG. Pretreatment process for the distillation of crude phthalic anhydride. 3,655,521, Cl. 203-28.
Gelezunas, Vincent L., to General Electric Company. Apparatus for water detection using a radioactive tritium labelled reactant. 3,655,982, Cl. 250-106.
Gelfand, Samuel, to Hooker Chemical Corporation. Halogen containing ketones, acid halides and processes. 3,655,765, Cl. 260-586.
Gemmill, Robert M., Jr.: *See—*
Schick, John W.; and Gemmill, Robert M., Jr.,3,655,561.
General American Transportation Corporation: *See—*
Stevens, Bernard, 3,655,109.
General Datacomm Industries: *See—*
Liberman, Richard Allen; and Davis, Steven Jay, 3,655,915.
General Electric Company: *See—*
Benz, Mark G., 3,655,463.
Benz, Mark G., 3,655,464.
Chafaris, George J., 3,655,371.
Corman, James C.; and Kelly, Peter E., 3,656,035.
Curry, Robert W., III, 3,654,772.
Davidson, William E.; and Busby, Llewellyn D., 3,654,715.
Gelezunas, Vincent L., 3,655,982.
Greenwood, Allan N., 3,656,022.
Konrad, Charles E., 3,656,039.
Lee, Art, 3,656,005.
Maher, William M., 3,656,018.
Meeks, Frederick T., 3,654,937.
Rairden, John R., III, 3,655,544.
Rexford, Donald L., 3,654,943.
Robb, Robert E., 3,655,906.
Scott, Ernest R., 3,654,661.
Staples, Paul R., 3,656,182.
Walter, John L.; Cline, Harvey E.; and Cobine, James D., 3,655,368.
General Foods Corporation: *See—*
Cseri, Joseph; Halik, Joseph John; and Kaplow, Milton, 3,655,400.
Glasser, George; Hollis, Frank; and Kaplow, Milton, 3,655,404.
Glasser, George; and Cseri, Joseph, 3,655,409.
Halik, Joseph John, 3,655,401.
Parliment, Thomas H.; Clinton, William P.; Scarpellino, Richard; Soukup, Robert J.; and Epstein, Martin F., 3,655,397.
Pitchon, Esra; Gottesman, Martin; and Meier, Robert W., 3,655,398.
Pitchon, Esra; and Earle, Ernest L., Jr., 3,655,399.
Tower, Horace L., 3,655,089.
General Instrument Corporation: *See—*
Baker, Lamar T., 3,656,119.
General Mills, Inc.: *See—*
Mattison, Philip L.; and Swanson, Ronald R., 3,655,347.
General Motors Corporation: *See—*
Johnson, Douglas, 3,655,223.
Ruff, Donald O., 3,656,135.
Seagreaves, George F., 3,655,275.
Stewart, Ted, 3,655,238.
General Tire & Rubber Company, The: *See—*
Long, Fred E., 3,655,421.
Rinehart, Verne R., 3,655,729.
Gentex Corporation: *See—*
Luisada, August G., 3,655,087.
Gentile, Carlos A., to Califoam Corporation of America. Automatic contouring machine for foam blanks. 3,654,735, Cl. 51-5.
Genuit, Luther L.; and Nowell, John R., to Honeywell Information Systems, Inc. Apparatus for providing regulated voltage during brief power interruptions. 3,656,052, Cl. 323-17.
Georgia Kaolin Company: *See—*
Chapman, John H., 3,655,417.
Gerbasi, Dennis P.: *See—*
Donohue, James M.; and Gerbasi, Dennis P.,3,654,901.
Gerber Scientific Instrument Company, The: *See—*
Rich, Leonard G., 3,656,014.
Gerbier, Gerard Marcel; and Dechenaux, Victor Louis, to Societe des Accumulateurs Fixes et de Traction (Societe Anonyme). Method of preparation of cupric sulfide electrodes. 3,655,446, Cl. 136-23.
Gerke, Peter; Rutkowski, Karl; and Bock, Helmuth Joachim, to Siemens Aktiengesellschaft. Switching arrangement for telephone exchange installation. 3,655,922, Cl. 179-18.
Gerlach, Richard K.: *See—*
Bucklin, Edward P., Jr.; Evans, Pat E.; and Gerlach, Richard K.,3,656,130.
Gerns, Fred R.: *See—*
Thomas, Robert M.; and Gerns, Fred R.,3,655,788.
Gersch, Richard C. Adjustable tool block assembly. 3,654,826, Cl. 82-1.2
Gertsen, Kai, to Sybron Corporation. Positioner. 3,655,069, Cl. 214-1.
Gervais, Adrien C. Tobacco harvesting machine. 3,654,753, Cl. 56-27.5
Geschwender, Robert C. Cellular structural products. 3,655,478, Cl. 156-202.
Geyer, Jerome; Hu, Shih-En; and Robbins, Max L., to Esso Research and Engineering Company. Mineral lubricating oil compositions containing alkaline earth metal sulfonates and phosphites and process producing same. 3,655,558, Cl. 252-33.
Ghyczy, Peter. Chair. 3,655,242, Cl. 297-445.
Gianese, Goffredo, to AMF Incorporated. Cigarette packer hopper automatic feeding device. 3,655,080, Cl. 214-302.
Gichner Mobile Systems, Inc.: *See—*
Lane, Frank B.; and Fulmer, George M., 3,655,214.
Giddings & Lewis, Inc.: *See—*
McGee, John K., 3,656,124.
Giepen, Hubert M. Stamp vending machine having knife to separate stamps. 3,655,022, Cl. 194-2.
Gier, Delta W.; and Wasleski, Daniel M., to Chemogro Corporation. Chloronitrophenyl ethers as nematocides. 3,655,893, Cl. 424-250.
Gifft, T. H., Co., Inc.: *See—*
Gifft, Thomas H.; and Adams, Francis E., 3,655,914.
Gifft, Thomas H.; and Adams, Francis E., to Gifft, T. H., Co., Inc. Facsimile system. 3,655,914, Cl. 178-69.5
Gilbert, Everett E.; and Dear, Robert E. A., to Allied Chemical Corporation. Process for preparing fluoroisobutylenes and novel product. 3,655,786, Cl. 260-653.3
Giles, George R.; and Shuda, Donald G., to Sanders Associates, Inc. Data demodulator employing comparison. 3,656,064, Cl. 329-104.
Gillery, Frank H.; and Pressau, Jean P., to PPG Industries, Inc. Post heating of sputtered metal oxide films. 3,655,545, Cl. 204-192.
Gillum, Donald E., to Information Magnetics Corporation. Combined linear motor and carriage. 3,656,015, Cl. 310-13.
Gilman, John E., III: *See—*
Prouty, Robert E.; Gilman, John E., III; and Smith, James J.,3,656,076.

Gilmore, W. Franklin: *See—*
Klayman, Daniel L.; and Gilmore, W. Franklin,3,655,715.
Gilson, Russell A.; Kiss, William F.; and Organic, Vincent J., to United States of America, Army. Switching circuit. 3,656,002, Cl. 307-235.
Giwosky, Harry L., to Controls Company of America. Metering valve arrangement for oil control. 3,654,954, Cl. 137-400.
Glamour Pools Company: *See—*
Lankheet, Jay A., 3,654,639.
Glaser, Egon: *See—*
Mayer, Georg; and Glaser, Egon,3,655,254.
Glaser, Hermann: *See—*
Sennewald, Kurt; Vogt, Wilhelm; Erpenbach, Heinz; and Glaser, Hermann,3,655,747.
Glasser, George; and Cseri, Joseph, to General Foods Corporation. Coconut products and processes. 3,655,409, Cl. 99-125.
Glasser, George; Hollis, Frank; and Kaplow, Milton, to General Foods Corporation. Shelf stable french toast. 3,655,404, Cl. 99-92.
Glastron Boat Company: *See—*
Wilhoit, Jerry W., 3,654,648.
Glaverbel: *See—*
Javaux, Gustave, 3,655,356.
Globe-Union Inc.: *See—*
Jones, Kenneth R., 3,655,455.
Go Corporation, Inc.: *See—*
Bopp, Cecil W., 3,655,315.
Goba, Herberts K. Necktie knot-holding device. 3,654,633, Cl. 2-153.
Goberde, Bastiaan Cornelis: *See—*
Price, Richard Thompson; Bauer, Stuart Michael; Brownlee, John; and Goberde, Bastiaan Cornelis,3,655,838.
Gobstein, Saul, to Ferro Corporation. Nickel salts of mixed organic anions. 3,655,708, Cl. 260-439.
Godbersen, Byron L. Floating dock section. 3,654,885, Cl. 114-0.5
Godtfredsen, Wagn Ole, to Lovens Kemiske Fabrik Produktionsaktieselskab. 7(α-Amino-α-phenylacetamido)- cephalosporanate esters. 3,655,658, Cl. 260-243.
Goetz, Bernard, to Automobiles Peugeot, and Regie Nationale des Usines Renault. Method of making friction disc variators. 3,654,692, Cl. 29-558.
Goldbeck, Leroy J.; and Van Den Elzen, Norbert L., to Kimberly-Clark Corporation. Fire retarding treatment. 3,655,422, Cl. 117-46.
Goldberg, Abraham A.; and McMann, Renville H., Jr., to Columbia Broadcasting System, Inc. Apparatus for reproducing color picture information. 3,655,908, Cl. 178-5.4
Goldfarb, Fred A. Water vapor injection system and method for an internal combustion engine. 3,655,169, Cl. 261-35.000
Goldschmidt, Th., A.-G.: *See—*
Fink, Hans-Ferdi; Koerner, Gotz; Rossmy, Gerd; and Schmidt, Gunter, 3,655,554.
Rossmy, Gerd; and Koerner, Gotz, 3,655,555.
Rossmy, Gerd, 3,655,712.
Goldstein, Milton; Hair, George R.; Kutzenco, Jack; and Marchand, Jacques J., to Bondit Corporation. Apparatus for joining sheet material. 3,655,488, Cl. 156-380.
Goodwater, Harry C., to Audio Alert Corporation. Integrated fully supervised fire alarm system. 3,656,158, Cl. 340-409.
Goodyear Aerospace Corporation: *See—*
Bartucci, John F.; and Horton, James A., 3,655,260.
Goodyear, W. Frederick: *See—*
Belcher, Richmond D.; Duggan, Robert J.; Ellis, George R.; Esslinger, Robert H.; Goodyear, W. Frederick; Marshall, Joseph C.; and Masone, Thomas R.,3,656,148.
Gordon, William F.; and Newman, James W., to Windings, Inc. Machine for winding flexible material. 3,655,140, Cl. 242-18.
Goto, Yasuo; and Taki, Akio, to Nihon Shokuhin Kako Co., Ltd. Process for preparing pulverized feed for animals. 3,655,396, Cl. 99-9.
Gottesman, Martin: *See—*
Pitchon, Esra; Gottesman, Martin; and Meier, Robert W.,3,655,398.
Grace, W. R., & Co.: *See—*
Moyer, Joseph D., 3,655,754.
Rettew, Richard Raymond; Wirth, David Griffith, Jr.; and Levy, Newton, Jr., 3,655,330.
Grafius, Gerald R., to Automatic Devices, Inc. Parts gager. 3,655,042, Cl. 209-91.
Grain Processing Corporation: *See—*
Durand, Harry Walter, 3,655,644.
Gramain, Jean Charles Marie, to Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes. Closure members for pipe sections. 3,654,965, Cl. 138-89.
Gramall Industries Proprietary Limited: *See—*
Roach, Ronald John; and Mitchell, Graham George, 3,654,955.
Granatek, Alphonse Peter; Granatek, Edmund Stanley; and Ratto, Peter Angelo, to Bristol-Myers Company. Water soluble magnesium-aluminum antacid composition. 3,655,883, Cl. 424-157.
Granatek, Edmund Stanley: *See—*
Granatek, Alphonse Peter; Granatek, Edmund Stanley; and Ratto, Peter Angelo,3,655,883.
Grant, Perry J., to Klamer, Reuben, d/b/a Klamer, Reuben, & Associates. Game with free fall playing pieces and selectively placed support pegs. 3,655,191, Cl. 273-95.
Grass, George M., Jr.; and Unangst, Raymond R., to Smith Kline & French Laboratories. Glyceryl tristearate and higher fatty acid mixture for improving digestive absorption. 3,655,864, Cl. 424-38.
Grau, George S.: *See—*
Contois, Lawrence E.; Merrill, Stewart H.; and Grau, George S.,3,655,378.
Gray, Frederick William, to Colgate-Palmolive Company. Bleaching and detergent compositions. 3,655,567, Cl. 252-95.
Gray, Leonard W. Passenger coach for pick-up trucks. 3,655,235, Cl. 296-23.
Great Lakes Chemical Corporation: *See—*
Thomas, Robert M.; and Gerns, Fred R., 3,655,788.
Greaves, Wellington N., to United Aircraft Corporation. Vapor deposition of alloys. 3,655,430, Cl. 117-107.
Green, Albert Lawrence: *See—*
Fielden, Roy; Green, Albert Lawrence; and Hills, Derek William,3,655,757.
Greening, Donald J.; Kintner, Paul M.; and Strand, Sanford M., to Cutter-Hammer, Inc. Percentage elongation calibrated digital pulse deleter. 3,655,950, Cl. 235-92.
Greenland, Leonard Sidney; Smith, Charles Philip; and Marshall, David, to Hobson, H. M., Limited. Jet engines for aircraft. 3,655,134, Cl. 239-265.37
Greenwood, Allan N., to General Electric Company. Alternating current circuit breaker comprising a series reactor for shaping current and voltage waves near current zero. 3,656,022, Cl. 317-11.
Gref, Hans: *See—*
Herzhoff, Peter; Gref, Hans; and Platz, Stephan,3,654,899.
Gretzky, Anthony J., to Brunswick Corporation, The. Penetrable target screen. 3,655,203, Cl. 273-181.
Griepentrog, Heinz: *See—*
Becker, Gustav; Griepentrog, Heinz; Klebert, Wolfgang; and Reich, Friedrich,3,655,437.
Griffith & Associates, Inc.: *See—*
Griffith, Vernon D., 3,655,290.
Griffith, Vernon D., to Griffith & Associates, Inc. Applicator instrument. 3,655,290, Cl. 401-186.
Griffiths, Leonard B.; and Krock, Richard H., to Mallory, P. R., & Co., Inc. Means and method for making porous bodies of integral structure. 3,655,447, Cl. 136-30.
Griffiths, Thomas C., to Eaton Yale & Towne, Inc. Hydraulic control circuit. 3,654,833, Cl. 91-41.
Grilli, Umberto; Sturba, Bruno; and Vivani, Artemio. Keyboard. 3,654,831, Cl. 84-435.
Grillot, Robert E. Support. 3,655,160, Cl. 248-188.8
Groebel, Alfred; and Lindner, Ernst, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Pharmacologicaly effective substance and process for preparing it. 3,655,886, Cl. 424-195.
Grolig, Johann: *See—*
Kronig, Walter; and Grolig, Johann,3,655,759.
Gronemeyer, Erich W.: *See—*
Kutik, Louis F.; and Gronemeyer, Erich W.,3,655,308.
Grover, Robert Raymond. Recirculating bearing. 3,655,247, Cl. 308-6.
Gruber, Thomas J.; and Lyth, William W., to Eaton Yale & Towne, Inc. Solid state timing control for single cycle progressive lubricating systems. 3,656,140, Cl. 340-270.
Grundman, Roger V., to Minnesota Mining and Manufacturing Company. Torque transmitting device. 3,654,777, Cl. 64-30.
G. T. E. Laboratories, Incorporated: *See—*
Airey, John M., 3,656,050.
Gubelmann, Walter S.: *See—*
Gubelmann, William S.,3,655,953.
Gubelmann, William S., deceased0 (by Gubelmann, Walter S.; executor), to Realty & Industrial Corporation. Carry mechanisms for calculating machines. 3,655,953, Cl. 235-137.
Guenther, Karl R.; and Havekost, Donald G., to Bergstrom Paper Company, mesne. Paper coating compositions and paper therewith. 3,655,608, Cl. 260-37.
Guild Molders, Inc.: *See—*
Davidson, Emil, 3,654,939.
Guilmette, F. Peter; and Madison, Norman L., to Dow Chemical Company, The. Preparation of polyfunctional acrylates. 3,655,733, Cl. 260-486.
Gulf Development, Inc.: *See—*
Heavener, Edward A., 3,655,320.
Gulf Oil Corporation: *See—*
Brower, David F., 3,654,787.
Gulf Research & Development Company: *See—*
Bacha, John D.; and Selwitz, Charles M., 3,655,783.
Barie, Walter P., Jr., 3,655,499.
Fernald, Herbert B.; Gall, William; Gwynn, Bernard H.; and Ward, John V., 3,655,809.
Ondrey, John A.; and Swift, Harold E., 3,655,749.
Ondrey, John A.; and Swift, Harold E., 3,655,750.
Gundersen, James L., to Hughes Aircraft Company. Improved A-D/D-A converter system. 3,656,152, Cl. 340-347.
Gundlach, Robert W., to Xerox Corporation. Printing by vapor propulsion. 3,655,379, Cl. 96-27.
Gunther, Peter: *See—*
Oberkirch, Wolfgang; Gunther, Peter; and Pampus, Gottfried,3,655,584.
Guthrie, Robert M.: *See—*
Alcock, Richard A.; Guthrie, Robert M.; and Johnston, Robert B.,3,654,784.
Gutman, Arnold D., to Stauffer Chemical Company. Certain oxime esters. 3,655,761, Cl. 260-566.

Gwynn, Bernard H.: *See—*
Fernald, Herbert B.; Gall, William; Gwynn, Bernard H.; and Ward, John V.,3,655,809.

Haaf, Arthur: *See—*
Habermehl, Gerhard; and Haaf, Arthur,3,655,649.

Haas, Werner E. L.; Adams, James E.; Webster, Becker, James H.; Haas, Werner E. L.; Adams, James E.; Becker, James H.; Haas, Werner E. L.; Adams, James E.; Becker, James H.; Wysocki, Joseph J.; Haas, Werner E. L.; Adams, James E.; Becker, James H.; and Wysocki, Joseph J., to Xerox Corporation Xerox Corporation. Imaging system Imaging system. 3,655,971, Cl. 250-65.

Haberkorn, Erich J.; and Englaender. Klaus, to Messerschmitt-Bolkow-Blohm, G.m.b.H. Aircraft jet engine with vectoring nozzle for control purposes. 3,655,150, Cl. 244-53.

Habermehl, Gerhard; and Haaf, Arthur, to Merck Patent Gesellschaft mit beschrankter Haftung. Process for the preparation of 19-norsteroids. 3,655,649, Cl. 260-239.5

Hachtel, Wilhelm. Device for forming pleats on curtains. 3,654,983, Cl. 160-348.

Hadfield, Joseph M. Protective circuit. 3,656,023, Cl. 317-13.

Haegert, Clarence B. Electrical connector and method of making same. 3,656,094, Cl. 339-230.

Hagdahl, Erik Lennart, to Stora Kapparbergs Bergslags Aktiebolag. Gas or liquid filter. 3,655,060, Cl. 210-493.

Hagdorn, Manfred Otto, to Aktiebolaget Electrolux. Valve means for controlling discharge of waste liquid into pneumatic sewage disposal system. 3,654,953, Cl. 137-395.

Hagen, Helmuth: *See—*
Becke, Friedrich; and Hagen, Helmuth,3,655,686.

Hagfors, Norman R., to Medtronic Inc. Implatable electrode. 3,654,933, Cl. 128-418.

Hagino Kiko Company Limited: *See—*
Hagino, Seiji; Masuda, Kohei; Hasegawa, Kazumasa; and Hosono, Yasuzi, 3,655,486.

Hagino, Seiji; Masuda, Kohei; Hasegawa, Kazumasa; and Hosono, Yasuzi, to Hagino Kiko Company Limited, and Mitsubishi Petrochemical Company Limited. Apparatus for producing thermoplastic synthetic resin laminated material having a large number of independent air cells. 3,655,486, Cl. 156-360.

Hagman, JOhn F.: *See—*
Finlay, Joseph B.; and Hagman, JOhn F.,3,655,827.

Hair, Betty J., 10% to Raymond, Lee Organization, Inc., The. Mobile home. 3,655,236, Cl. 296-23.

Hair, George R.: *See—*
Goldstein, Milton; Hair, George R.; Kutzenco, Jack; and Marchand, Jacques J.,3,655,488.

Hakanson, Nils L., to Plastic Coating Corporation, The. Toner unit for photoelectrostatic reproduction. 3,654,902, Cl. 118-637.

Hale, David A.; and Housman, Earl R. Vehicular antitheft device having relay switches for interrupting induction coil circuit and for activating an alarm. 3,656,102, Cl. 340-64.

Halik, Joseph John: *See—*
Cseri, Joseph; Halik, Joseph John; and Kaplow, Milton,3,655,400.

Halik, Joseph John, to General Foods Corporation. Pasta process and products. 3,655,401, Cl. 99-85.

Hall China Company: *See—*
Simmen, Fred G., 3,655,843.

Hall, Harold G.; and Palmer, Rufus N., to Steiner, Daniel N., mesne. Apparatus for vending periodicals having self- compensating dispenser for decreasing supply. 3,655,092, Cl. 221-133.

Hall, Leland V., to Oasis Electronics. Molding die structure. 3,655,323, Cl. 425-438.

Hall, Roger L.; McKenney, Gordon M., Jr.; and Wall, Alfred J. Light ray projector and target. 3,655,192, Cl. 273-101.1

Hall, Roger P., to SCM Corporation. Adhering resins to substrates, especially metal, by radiation. 3,655,481, Cl. 156-272.

Hallhagen, Sven Goran: *See—*
Carlsson, Per Arvid Emil; Corrodi, Hans Rudolf; Hallhagen, Sven Goran; and Junggren, Ulf Krister,3,655,737.

Hamac-Hansella GmbH: *See—*
Beckers, Hans, 3,654,746.

Hamel, David O., to ESB Incorporated. Dry cell battery. 3,655,456, Cl. 136-181.

Hamilton, Alexander, to Ciba-Geigy AG. Unsymmetrical disazo pigments derived from dichlorobenzidine and acetylarylamides. 3,655,641, Cl. 260-176.

Hamilton, Martin W.: *See—*
Jones, William H.; and Hamilton, Martin W.,3,655,002.

Hamm, John R., to Borg-Warner Corporation. Valve. 3,654,950, Cl. 137-219.

Hamma, John C., to Interscience Corporation. Infusion monitoring device. 3,656,138, Cl. 340-266.

Hammond, Donald L., to Hewlett-Packard Company. Resonant piezoelectric acousto-optic light filter and apparatus using same. 3,655,265, Cl. 350-149.

Hampton, Robert W., to Eastman Kodak Company. Reflex camera apparatus. 3,654,844, Cl. 95-42.

Hannam, Mervyn John: *See—*
Hardy, Clarence James; Lane, Edward Sydney; and Hannam, Mervyn John,3,655,418.

Happe, Wilhelm: *See—*
Hoyer, Hans; Keil, Gunter; and Happe, Wilhelm,3,655,844.

Harcourt, David N.; and Brooks, James R., to Allen & Hanburys Limited. 2-Methyl-5-phenyl-1,2-dihydro-3H-2-benzazepine or a salt thereof and process for preparing same. 3,655,651, Cl. 260-239.

Hardin, Wise J. Method for removing broken studs. 3,654,690, Cl. 29-427.

Harding, John Kammerer, to Dowty Technical Developments Limited. Fuel injection systems. 3,654,908, Cl. 123-140.

Hardwig, Ernest B. System for sorting mail bags. 3,655,030, Cl. 198-135.

Hardy, Clarence James; Lane, Edward Sydney; and Hannam, Mervyn John, to United Kingdom Atomic Energy Authority. Production of pigments. 3,655,418, Cl. 106-304.

Harkins, Alvin E., Jr., to Ethyl Corporation. Distillation of olefins with alkanol addition to prevent degradation. 3,655,520, Cl. 203-6.

Harnisch, Heinz: *See—*
Kribbe, Kurt Willi Harri,3,655,334.

Harnsberger, Bobby G.; and Payton, Joy T., to Texaco Inc. Hydraulic fracturing method. 3,654,990, Cl. 166-281.

Harnsberger, Bobby G.; and Payton, Joy T., to Texaco Inc. Fracturing method. 3,654,991, Cl. 166-281.

Harnsberger, Bobby G.; and Payton, Joy T., to Texaco Inc. Fracturing method. 3,654,992, Cl. 166-281.

Harri, Eugen: *See—*
Bollinger, Pietro; Harri, Eugen; and Sigg, Hans-Peter,3,655,880.

Harrigan, David J.: *See—*
Faria, Sixdeniel; and Harrigan, David J.,3,655,978.

Harrington, Edward F.: *See—*
Carberry, John L.; Carson, David C., Sr.; and Harrington, Edward F.,3,655,224.

Harwald Company, Inc., The: *See—*
Bowen, Howard; Henderson, David L.; and Wallace, Richard R., 3,655,945.

Harwood, William H., to Continental Oil Company. Anodic process for the preparation of tetraalkyl lead compounds. 3,655,536, Cl. 204-59.

Hasegawa, Kazumasa: *See—*
Hagino, Seiji; Masuda, Kohei; Hasegawa, Kazumasa; and Hosono, Yasuzi,3,655,486.

Hasegawa, Toru: *See—*
Higashide, Eiji; Hasegawa, Toru; Shibata, Motoo; and Mizuno, Komei,3,655,878.

Hass, Robert H.; Helfrey, Paul F.; and Kay, Nicholas L., to Union Oil Company of California. Hydrocracking-hydrogenation process. 3,655,551, Cl. 208-59.

Hastings, Donald M., Sr. Safety razor blade. 3,654,701, Cl. 30-346.56

Hatch, Richard W., Jr.; and Blaiklock, Paul M., to Fluidic Industries, Inc. Fluid switching device. 3,654,947, Cl. 137-81.5

Hauf, Adolf W., to United States of America, Interior. Non-linear exciter controller for power system damping. 3,656,048, Cl. 322-19.

Hauni-Werke Korber & Co. KG: *See—*
Wochnowski, Waldemar; and Friebel, Heinz, 3,655,043.

Hauser, Martin; and Hoinacki, Christine Elizabeth, to American Cyanamid Company. Polyester resins from 5-carboxy-m-phenylenediacetic acid. 3,655,622, Cl. 260-75.

Hausslein, Robert W.; and Molvar, Henry E., Jr., to Amicon Corporation. Abrasion resistant coating of polyether polyurethane. 3,655,432, Cl. 117-138.8

Hausweiler, Arnold: *See—*
Scherhag, Bernhard; and Hausweiler, Arnold,3,655,519.

Havekost, Donald G.: *See—*
Guenther, Karl R.; and Havekost, Donald G.,3,655,608.

Hawkins, William E., to Du Pont de Nemours, E. I., and Company. Electrostatic pinning of dielectric film. 3,655,307, Cl. 425-109.

Hayami, Toshio: *See—*
Takamatsu, Yasuto; Ishii, Toshio; Hayami, Toshio; and Tsubota, Yoshiharu,3,655,887.

Hayashi, Isao, to Hayashi Telempu Co., Ltd. Manufacturing of sunvisors or glare shields for motor vehicles. 3,655,849, Cl. 264-98.

Hayashi Telempu Co., Ltd.: *See—*
Hayashi, Isao, 3,655,849.

Hayashibara, Yuji: *See—*
Kato, Tetsuji; Izumi, Mikio; Hayashibara, Yuji; and Suenaga, Kazuo,3,655,824.

Hayden, John T., Jr.; and Plasewicz, Casimir F., to Westinghouse Electric Corporation. Method for heat treating metallic strip material. 3,655,460, Cl. 148-13.1

Haydu, Bartley A. Transfer and lift mechanism. 3,655,070, Cl. 214-1.

Hayes, Barbara E.: *See—*
Lofquist, Robert A.; and Hayes, Brendan T.,3,655,821.

Hayes, Brendan T.: *See—*
Lofquist, Robert A.; and Hayes, Brendan T.,3,655,821.

Hayes, Jerry R., to Nelson, L. R., Mfg. Co., Inc. Nozzle coupling. 3,655,164, Cl. 251-347.

Hazard, Robert E., to Polytop Corporation. Rotatable spout closures with latch structures. 3,655,099, Cl. 222-153.

Hazard, Robert E., to Polytop Corporation. Safety dispensing closures. 3,655,103, Cl. 222-530.

Hazlewood, Lewis F., to Kidde, Walter & Company, Inc. Disposable tourniquet cover. 3,654,931, Cl. 128-327.

Hazumi, Kenji, to Sawafuji Electric Co., Ltd. Voltage regulating device for generators. 3,656,049, Cl. 322-27.

Healy, Kent A.; and Long, Richard P., to Research Corporation, mesne. Subterranean wall drain. 3,654,765, Cl. 61-11.

Healy, Lawrence W.; Wang, Wu Lan; and Wang, Tsu-Huai. Method of

producing a fibrous sheet composition. 3,655,471, Cl. 156-148.

Heavener, Edward A., to Gulf Development, Inc. Vacuum molding machine for angulated cavity form. 3,655,320, Cl. 425-388.

Hecker, Arthur C.: *See—*
Kauder, Otto S.; Leistner, William E.; and Hecker, Arthur C.,3,655,832.

Heffner, Donald Elwood: *See—*
Ziegler, George William, Jr.; Apa, Armand Samuel; and Heffner, Donald Elwood,3,654,793.

Heilmeier, George H., to RCA Corporation. Liquid crystal display assembly having independent contrast and speed of response controls. 3,655,269, Cl. 350-160.

Heimann, Georg. Magnetic lock. 3,654,782, Cl. 70-276.

Heimbach, Franz: *See—*
Schotten, Alfons; and Heimbach, Franz,3,655,056.

Heine, Heinz, to Farbenfabriken Bayer Aktiengesellschaft. Process for the catalytic production of hydroxyl- ammonium salts. 3,655,336, Cl. 23-117.

Heist, Hans: *See—*
Marx, Gerhard; and Heist, Hans,3,654,896.

Held, Charles J., Jr., to Ames, W. R., Company. Freestanding shelving apparatus with improved base member and column locking means. 3,655,159, Cl. 248-188.1

Helene Industries, Inc.: *See—*
Spangler, Ross; and Materre, Christine, 3,654,938.

Helfrey, Paul F.: *See—*
Hass, Robert H.; Helfrey, Paul F.; and Kay, Nicholas L.,3,655,551.

Heli-Coil Corporation: *See—*
Setzler, Paul C., 3,654,688.

Hellsten, Martin; and Emanuelsson, Jan, to Mo Och Domsjo Aktiebolag. Detergent compositions containing a sequestrant and optionally a bleaching agent having a reduced tendency to attack copper, zinc and aluminum. 3,655,569, Cl. 252-99.

Helm, Herbert W.; and Weir, Edgar V., to Smithe, F. L., Machine Company, Inc. Drive mechanism for an envelope machine. 3,656,036, Cl. 318-41.

Helmes, Christiaan T.: *See—*
Helmes, Gerardus P.; Helmes, Wilhelmina P. M.; Helmes, Christiaan T.; Helmes, Johan P. H.; and Helmes, Franciscus J.,3,655,479.

Helmes, Franciscus J.: *See—*
Helmes, Gerardus P.; Helmes, Wilhelmina P. M.; Helmes, Christiaan T.; Helmes, Johan P. H.; and Helmes, Franciscus J.,3,655,479.

Helmes, Gerardus P.; Helmes, Wilhelmina P. M.; Helmes, Christiaan T.; Helmes, Johan P. H.; and Helmes, Franciscus J., to Helmes Machinefabriek N.V. Method for gluing a strip of material against the side of a flat work piece, like a table leaf, and a device for performing this method. 3,655,479, Cl. 156-212.

Helmes, Johan P. H.: *See—*
Helmes, Gerardus P.; Helmes, Wilhelmina P. M.; Helmes, Christiaan T.; Helmes, Johan P. H.; and Helmes, Franciscus J.,3,655,479.

Helmes Machinefabriek N.V.: *See—*
Helmes, Gerardus P.; Helmes, Wilhelmina P. M.; Helmes, Christiaan T.; Helmes, Johan P. H.; and Helmes, Franciscus J., 3,655,479.

Helmes, Wilhelmina P. M.: *See—*
Helmes, Gerardus P.; Helmes, Wilhelmina P. M.; Helmes, Christiaan T.; Helmes, Johan P. H.; and Helmes, Franciscus J.,3,655,479.

Helms, Gerd: *See—*
Gehrken, Hubert; Helms, Gerd; Keunecke, Gerhard; and Krimphove, Herbert,3,655,521.

Helmuth, James G., to Chadwick-Halmuth Electronics, Inc. Stabilization of multiple shaker systems. 3,654,804, Cl. 73-71.6

Hemdal, Hakan O.: *See—*
Ross, Joseph A.; and Hemdal, Hakan O.,3,656,154.

Henderson, David L.: *See—*
Bowen, Howard; Henderson, David L.; and Wallace, Richard R.,3,655,945.

Hengehold, Leo L. Universal milling and boring machines. 3,654,818, Cl. 74-331.

Henisch, Heinz K., to Energy Conversion Devices, Inc. Controllable semiconductor switch. 3,656,032, Cl. 317-235.

Henkel & Cie G.m.b.H.: *See—*
Saran, Herbert; and Budnowski, Manfred, 3,655,624.

Hensley, Justin C., Jr.; and Young, Paul G. Molded plastic solar still. 3,655,517, Cl. 202-234.

Hepner, Neal, to Burroughs Corporation. Rotating fixture-mold for fabricating printing drums. 3,655,309, Cl. 425-109.

Hercules Incorporated: *See—*
Buchanan, Jack M., 3,655,859.
Dehm, Henry C.; and Mellow, Dale F., 3,655,836.
Fritz, Fred A., 3,654,866.
Josephson, Roy R., 3,655,707.
Sanderson, Thomas F., 3,655,635.
Vandenberg, Edwin J., 3,655,586.

Hermes, Walter L.; and Jones, Charles, to Curtiss-Wright Corporation. Rotor and gear assembly for rotary mechanisms. 3,655,302, Cl. 418-61.

Herzer, Kurt Company, The: *See—*
Herzer, Kurt; and Mertens, Wolfgang, 3,655,241.

Herzer, Kurt; and Mertens, Wolfgang, to Herzer, Kurt Company, The. Adjustable head rest for vehicles. 3,655,241, Cl. 297-408.

Herzhoff, Peter; Gref, Hans; and Platz, Stephan, to Agfa-Gevaert Aktiengesellschaft. Apparatus for coating foils or bands on one side with solutions of high viscosity. 3,654,899, Cl. 118-419.

Hesselgren, Tore Gottfrid. Electronic lock arrangement having parallel coded input. 3,656,114, Cl. 340-164.

Hestad, Alfred M.: *See—*
Marbury, Benjamin R.; Hestad, Alfred M.; and Reines, Jose,3,655,918.

Hester, Jackson B., Jr., to Upjohn Company, The. Azepinoindolones. 3,655,647, Cl. 260-239.3

Hewlett-Packard Company: *See—*
Hammond, Donald L., 3,655,265.

Hidalgo, John: *See—*
Allen, Robert E.; Thompson, Charles R.; and Hidalgo, John,3,655,680.

Higashi, Louis M., to Memorex Corporation. Epoxy binder for magnetic coating composition. 3,655,595, Cl. 260-18.

Higashide, Eiji; Hasegawa, Toru; Shibata, Motoo; and Mizuno, Komei, to Takeda Chemical Industries, Ltd. Lateriomycins A and B and production thereof. 3,655,878, Cl. 424-121.

Higashide, Eiji: *See—*
Nakazawa, Koiti; Shibata, Motoo; Higashide, Eiji; Kanzaki, Toshihiko; Yamamoto, Hiroichi; Miyake, Akira; Ueyanagi, Jisaburo; and Iwasaki, Hidesuke,3,655,879.

Higuchi, Shunichiro; and Katayose, Kazunobu, to Okamura Manufacturing Company, Limited. Clutch control system for motor vehicles. 3,655,018, Cl. 192-4.

Hilbig, Jack H., to Rohr Corporation. Sound suppression system for jet engine. 3,655,007, Cl. 181-33.

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Hill, Forrest G.; and Kelly, Samuel H., to Marsh Stencil Machine Company. Inking cartridge for tape coder. 3,654,863, Cl. 101-335.

Hill, Frank C. Bird-scattering device. 3,656,141, Cl. 340-272.

Hill, William J.: *See—*
Kinnicutt, Roger, Jr.; and Hill, William J.,3,655,079.

Hills, Derek William: *See—*
Fielden, Roy; Green, Albert Lawrence; and Hills, Derek William,3,655,757.

Himebaugh, Donald T.: *See—*
Brown, James L.; Himebaugh, Donald T.; and Montgomery, James R.,3,655,985.

Hinds, David, to Vickers Limited. Means for noise reduction in output of photoemissive cell comprising periodically discharged integrator capacitor. 3,655,987, Cl. 250-206.

Hinds, Francis Michael: *See—*
Brown, George A.; and Hinds, Francis Michael,3,655,122.

Hinteregger, Peter, KG, Firma: *See—*
Eisenbach, Joachim, 3,655,110.

Hirai, Hajime: *See—*
Kitamura, Shige Yoshi; Hirai, Hajime; Okuno, Yositosi; and Fujimoto, Keimei,3,655,654.

Hirano, Jiro: *See—*
Miyauchi, Tsuneshige; Hirano, Jiro; Ueki, Atsufumi; Tatsumi, Ryuji; Mukai, Kunihiro; and Yoshikawa, Shogon,3,655,259.

Hirn, Hans, to American Can Company. Positive feed transfer for pin conveyor. 3,655,026, Cl. 198-25.

Hirooka, Masaaki: *See—*
Yamamoto, Keisaku; Takao, Hiroyoshi; Hirooka, Masaaki; and Oshima, Teruo,3,655,583.

Hirs, Gilles Gerardus, to Nederlandse Organisatie voor Toegepast-Natuurweten- Schappelijk Onderzoek ten Behoeve Van Nijverheid. Bearings and seals with a grooved bearing surface. 3,655,248, Cl. 308-9.

Hirsch, Robert L., to International Telephone and Telegraph Corporation. Electrostatic field apparatus for reducing leakage of plasma from magnetic type fusion reactors. 3,655,508, Cl. 176-5.

Hirsh Company, The: *See—*
Ferdinand, Irwin J.; and Kulbersh, Irwin R., 3,654,879.

Hitachi Chemical Company, Ltd.: *See—*
Uchida, Shinzi; Nishizawa, Hiroshi; and Sone, Yasuo, 3,655,628.

Hitachi, Ltd.: *See—*
Kano, Tsuyoshi; Otomo, Yoshiro; and Yamamoto, Hajime, 3,655,577.
Nakagomi, Yoshiyuki, 3,656,008.

Hoare, Robert C., to Allied Chemical Corporation. Water soluble lithium-N-benzoyl-2-[[1-(dichloro- phenyl)-3-methyl-5-oxo-2-pyrazolin-4-yl] azo] sulfinates. 3,655,640, Cl. 260-162.

Hoashi, Kenzo, to Kabushiki Kaisha. Hydraulically driven vehicle. 3,655,004, Cl. 180-6.48

Hobbs, Charles F.; and Wilson, James Dennis, to Monsanto Company. 1,2,3,5-Tetramethyl pyrazolium chloride and method for preparation. 3,655,690, Cl. 260-310.

Hobbs, James C., II. Expendable hemostat. 3,654,930, Cl. 128-325.

Hobbs, James C., II. Method and apparatus for measuring and proportioning fluids. 3,655,094, Cl. 222-1.

Hobson, H. M., Limited: *See—*

Greenland, Leonard Sidney; Smith, Charles Philip; and Marshall, David, 3,655,134.

Hoch, Samuel, to Tenneco Chemicals, Inc. Organotin mercaptoacid ester stabilizers for vinyl halide resin compositions and compositions stabilized therewith. 3,655,703, Cl. 260-429.7

Hocks, Peter: *See*—
Furst, Andor; Furlenmeiter, Andre; Langemann, Albert; Waldvogel, Guy; Hocks, Peter; Kerb, Ulrich; and Wiechert, Rudolf,3,655,650.

Hodgins, Howard A.; Braggard, Adolphe Andre; and Hodgins, Howard A., to Enterprise Machine and Development Corp. Centre National de Recherches Metallurgiques Enterprise Machine and Development Corporation. Vibratory bowl for feeding buttons Coating metallic materials Vibratory bowl for feeding buttons. 3,655,028, Cl. 193-33.

Hoerner Waldorf Corporation: *See*—
Jeffers, James E., 3,655,112.

Hoesch, Eberhard & Sohne: *See*—
Schotten, Alfons; and Heimbach, Franz, 3,655,056.

Hoffman, Bernard A., to Schramm, Inc. Large diameter earth drill. 3,655,001, Cl. 175-213.

Hoffman, Mark; and Lindquist, Claude Alan, Jr., to Pfizer Inc. Light diffusion device. 3,655,263, Cl. 350-126.

Hoffman, William D.; and Larson, Allen E., to Atlantic Richfield Company. Foundry mold process and pattern composition. 3,655,414, Cl. 106-38.8

Hoffmann, Helmut; and Hoffmann, Walter. Universal folding ladder. 3,655,012, Cl. 182-163.

Hoffmann, Walter: *See*—
Hoffmann, Helmut; and Hoffmann, Walter,3,655,012.

Hoffmann-La Roche Inc.: *See*—
Furst, Andor; Furlenmeiter, Andre; Langemann, Albert; Waldvogel, Guy; Hocks, Peter; Kerb, Ulrich; and Wiechert, Rudolf, 3,655,650.
Kierstead, Richard Wightman; and Rosen, Perry, 3,655,653.
Klaui, Heinrich, 3,655,406.
Koff, Arnold; and Magid, Louis, 3,655,852.
Liemgruber, Willy; and Weigele, Manfred, 3,655,716.
Osbond, John Mervyn; and Philpott, Peter George, 3,655,684.

Hofmann, Alfred: *See*—
Mueller-Tamm, Heinz; and Hofmann, Alfred,3,655,504.

Hoinacki, Christine Elizabeth: *See*—
Hauser, Martin; and Hoinacki, Christine Elizabeth,3,655,622.

Holan, George; and Samuel, Eva Lea, to Monsanto Chemicals (Australia) Limited. N-Alkoxy-2-benzimidazole carboximidoyl chlorides. 3,655,688, Cl. 260-309.2

Holderith, William J., to Dickinson, Becton and Company. Plasma separator system. 3,654,925, Cl. 128-272.

Holiday, Morton J. Connector for control circuits for a tape perforator. 3,656,085, Cl. 339-91.

Holler, Hans, to Gebruder Holler G.m.b.H. Packing of relatively flat articles. 3,655,180, Cl. 270-58.

Hollis, Frank: *See*—
Glasser, George; Hollis, Frank; and Kaplow, Milton,3,655,404.

Holly, James A., to Hollymatic Corporation. Molding device for plastic material. 3,654,665, Cl. 17-32.

Hollymatic Corporation: *See*—
Holly, James A., 3,654,665.

Holmgren, William C.: *See*—
Rosen, Ian K.; and Holmgren, William C.,3,654,980.

Holotron Corporation: *See*—
Hilderbrand, Bernard P., 3,655,258.

Holt, Brian, to Ciba-Geigy Corporation. Akylated diphenylamines as stabilizers. 3,655,559, Cl. 252-951.5

Holtkamp, Calvin J., to Westinghouse Electric Corporation. Single polarity oven control. 3,655,943, Cl. 219-491.

Holtz, Frederick C., Jr., to IIT Research Institute. High speed tool alloys and process. 3,655,365, Cl. 75-123.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Watanabe, Yoshinori, 3,655,016.

Honeywell Inc.: *See*—
Ages, Frederik J., 3,654,963.
Keflas, John H., 3,655,441.
Nelson, Richard E., 3,654,948.

Honeywell Information Systems, Inc.: *See*—
Genuit, Luther L.; and Nowell, John R., 3,656,052.
Srivastava, Keshava; and Dixon, Samuel J., 3,656,149.

Honeywell Information Systems Italia S.p.A.: *See*—
Bonzano, Giorgio, 3,656,041.

Honjo, Satoru: *See*—
Takimoto, Masaaki; Sato, Masamichi; and Honjo, Satoru,3,655,966.
Tamai, Yasuo; Matsumoto, Seiji; and Honjo, Satoru,3,655,419.

Hoogovens Delfstoffen N.V.: *See*—
Moddemeijer, Jan H.; and Zijlstra, Dirk Jogchum, 3,654,825.

Hooker Chemical Corporation: *See*—
Carlson, Ronald H., 3,655,573.
Gelfand, Samuel, 3,655,765.
Lin, Kingso C.; and Geering, Emil J., 3,655,423.
Peterson, John A., 3,655,335.
Quinn, Edward J., 3,655,531.
Weil, Edward D., 3,655,618.

Hooper, William J., to Electrodynamic Gravity, Inc. Apparatus for generating motional electric field. 3,656,013, Cl. 310-10.

Horn, Arthur H., to Stehling, Chas. H., Company. Method of and apparatus for feeding workpieces to two machine units. 3,655,024, Cl. 198-20.

Horsley, Lee H.: *See*—
Seeburger, Harold O.; and Horsley, Lee H.,3,655,522.
Seeburger, Harold O.; and Horsley, Lee H.,3,655,523.

Horton, James A.: *See*—
Bartucci, John F.; and Horton, James A.,3,655,260.

Hosoi, Susumu: *See*—
Yamamoto, Shohei; Watanabe, Jun; Hosoi, Susumu; Kuwazaki, Masahiro; Ota, Akira; Takata, Toshikatsu; and Asaoka, Junichi,3,655,449.

Hosono, Yasuzi: *See*—
Hagino, Seiji; Masuda, Kohei; Hasegawa, Kazumasa; and Hosono, Yasuzi,3,655,486.

Houben, Jan P., to N.V. COQ. Gas pressure damper means for a circuit breaker mechanism. 3,655,935, Cl. 200-166.

Houlihan, William J.; and Manning, Robert E., to Sandoz-Wander, Inc. 2,5-Benzodiazonin-3-ones. 3,655,648, Cl. 260-239.3

House, Ronald Raymond, to American Cyanamid Company. Ceiling tile carrying anti-sag coating. 3,655,431, Cl. 117-126.

Housman, Earl R.: *See*—
Hale, David A.; and Housman, Earl R.,3,656,102.

Hover, Borre, to A/S Norsk Vitefabrikk. Ceiling structure with lights. 3,655,961, Cl. 240-9.

Howard, Arthur G.: *See*—
Crisman, Marilou; and Howard, Arthur G.,3,654,629.

Howe, Harald O.; and Zaschke, Wolfgang. Manhole setup for sewer systems. 3,654,952, Cl. 137-363.

Howe, Leland D., Jr.: *See*—
Carnevale, Richard J.; Howe, Leland D., Jr.; Metz, Thomas A.; Womack, Karl K.; and Zurla, Frank A.,3,656,123.

Howes, Harold L., Jr.; and Koch, Richard C., to Pfizer Inc. 2-Benzyl-astriazine-3,5(2H,4H) diones for the control of coccidiosis. 3,655,891, Cl. 424-249.

Hoyer, Hans; Keil, Gunter; and Happe, Wilhelm, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Process for the manufacture of shaped structures with improved dye affinity. 3,655,844, Cl. 264-78.

Hsiao, Mu-Yue; and Mikhail, Wadie F., to International Business Machines Corporation. Automatic double error detection and correction apparatus. 3,656,107, Cl. 340-146.1

Hu, Shih-En: *See*—
Geyer, Jerome; Hu, Shih-En; and Robbins, Max L.,3,655,558.

Hubbell, Franklin R., III, to Tenneco, Inc. Plural diameter tube. 3,654,764, Cl. 60-324.

Hubel, Otto, to Dupol-Rubbermaid GmbH Fabrik fur Gummi- und Kunststofferzeugnisse. Foot mat for vehicles. 3,654,657, Cl. 15-215.

Huck Manufacturing Company: *See*—
Orloff, John F., 3,655,227.

Hughes Aircraft Company: *See*—
Dunlap, Howard L., 3,654,694.
Gundersen, James L., 3,656,152.

Hughes, John Joseph: *See*—
Napoli, Louis Sebastian; and Hughes, John Joseph,3,656,030.

Hugin, Adolph C. Sewage lift station. 3,655,053, Cl. 210-152.

Hume, George Dennis. Tank structure. 3,655,057, Cl. 210-288.

Hunger, Kaus: *See*—
Meininger, Fritz; and Hunger, Kaus,3,655,642.

Hunt-Wesson Foods, Inc.: *See*—
Dougan, Ernest V., 3,655,402.

Hurlburt, Joseph C.: *See*—
Ostergren, William F.; and Hurlburt, Joseph C.,3,654,749.

Huron, Josephine E. Process for forming a decorative structure. 3,655,469, Cl. 156-63.

Hurth, Carl, Maschinen und Zahnradfabrik: *See*—
Loos, Herbert; and Kretzschmar, Karl, 3,654,791.

Husges, Walter, to Siempelkamp, G., & Co. Unloading mechanism for single-level platen press. 3,655,316, Cl. 425-161.

Hutzler, George J.; and Farah, Basil S., to Textron Inc. Process for preparing solid particles of urea- urethane polymers. 3,655,627, Cl. 260-77.5

Huyben, Bernardus Johannes Maria; Van Barneveld, Evert Jan; and Van De Steen, Louwrens Marinus, to U.S. Philips Corporation. Transistorized master slave flip-flop circuit. 3,656,010, Cl. 307-279.

Hydro-Stack Mfg. Corporation: *See*—
Kiernan, Henry E., 3,654,960.

I-T-E Imperial Corporation: *See*—
Zocholl, Stanley E., 3,656,026.

Ichikawa, Kiyoshi; and Fujioka, Akira, to Kabushiki Kaisha Hitachi Seisakusho. Data information signal generator. 3,656,133, Cl. 340-207.

Icre, Pierre; and Laizier, Jacques, to Commissariat A l'Energie Atomique. Irradiation cell for irradiating a continuously flowing liquid with an electron beam. 3,655,965, Cl. 250-45.

Idemitsu Kosan Co., Ltd.: *See*—
Yamato, Masaru, 3,655,445.

IIT Research Institute: *See*—
Holtz, Frederick C., Jr., 3,655,365.

Ilford Limited: *See*—
Wood, Henry Walter, 3,655,384.
Wood, Henry Walter, 3,655,386.

Illingsworth, Bernard D., deceased0 (by Illingsworth, Mary D.; executrix), to Eastman Kodak Company. Preparation of silver halide grains. 3,655,394, Cl. 96-108.

Illingsworth, Mary D.: *See—*
Illingsworth, Bernard D.,3,655,394.
Imai, Tunemichi: *See—*
Ueda, Terumori; and Imai, Tunemichi,3,654,785.
Imamura, Hiroshi: *See—*
Nakanishi, Michio; Tahara, Tetsuya; Imamura, Hiroshi; and Maruyama, Yutaka,3,655,681.
Nakanishi, Michio; Tahara, Tetsuya; Imamura, Hiroshi; and Maruyama, Yutaka,3,655,682.
Imoehl, Wolfgang; and Borner, Peter, to Schering AG. Hardening of polyepoxy compounds with dicyandiamide and a heterocyclic secondary amine accelerator. 3,655,617, Cl. 260-47.
Imperato, Joseph, to Sport Games, Inc. Model airplane. 3,654,729, Cl. 46-80.
Imperial Chemical Industries Limited: *See—*
Davies, George Edward; Dukes, Michael; and Johnston, Thomas Paterson, 3,655,896.
Inagaki, Junpei; and Marumo, Hitoshi, to Tokyo Shibaura Electric Co., Ltd. Electric synchronous machine having a comb-shaped pole type rotor. 3,656,017, Cl. 310-90.
Index-Werke K.G., Hahn & Tessky: *See—*
Link, Helmut, 3,654,819.
Industrial Nucleonics Corporation: *See—*
Bossen, David A., 3,655,980.
Doering, George I., 3,655,976.
Dukes, John R., 3,655,984.
Jernigan, Ernest D., Jr., 3,655,979.
Industrie Pirelli S.p.A.: *See—*
De Santis, Ermenegildo, 3,654,813.
Tangorra, Giorgio, 3,655,454.
Industrionics Controls, Inc.: *See—*
Wintriss, George Victor, 3,656,139.
Information Magnetics Corporation: *See—*
Gillum, Donald E., 3,656,015.
Ingels, Glenn R. Saturated fluid mixtures generator. 3,655,172, Cl. 261-130.
Ingenuics, Inc.: *See—*
Craig, Dwin R., 3,655,274.
Inglis, Leslie R.; and Peter, Joseph E., to Vortec Corporation. Vortex tube cooling system. 3,654,768, Cl. 62-5.
Institut Francais du Petrole des Carburants et Lubrifiants: *See—*
Chauvin, Yves; Lefebvre, Gilles; and Uchino, Masahiro, 3,655,810.
Lassau, Christian; and Sajus, Lucien, 3,655,799.
Institut fur Silikon- und Fluorkarbonchemie: *See—*
Dathe, Christian, 3,655,714.
Insul-Fil Manufacturing Company: *See—*
Barrington, Jonathan, 3,655,564.
Integral Process Systems, Inc.: *See—*
Rohrbacher, James T.; and Wagner, Richard C., 3,654,894.
Integrated Mechanical Systems, Inc.: *See—*
Baker, Alexander; and Vosika, Eugene A., 3,655,041.
Intermountain Research & Development Corporation: *See—*
Seglin, Leonard; and Winnicki, Henry S., 3,655,331.
International Business Machines Corporation: *See—*
Ahn, Kie Y.; and Park, Kyu C., 3,656,029.
Bauernfeind, Carl J.; and Zeman, Raymond F., 3,656,060.
Carnevale, Richard J.; Howe, Leland D., Jr.; Metz, Thomas A.; Womack, Karl K.; and Zurla, Frank A., 3,656,123.
Duffy, Michael C.; Schumann, Paul A., Jr.; and Yeh, Tsu-Hsing, 3,655,457.
Hsiao, Mu-Yue; and Mikhail, Wadie F., 3,656,107.
Kemerer, Douglas W.; and Pomeranz, Jehoshua N., 3,656,004.
Langdon, Jack L., 3,656,028.
Maley, Gerald A.; and Walsh, James L., 3,656,117.
Rideout, Arthur J., 3,656,034.
Wiedmann, Siegfried K., 3,655,999.
International Dynetics Corporation: *See—*
Longo, Joseph F., 3,654,855.
International Flavors & Fragrances, Inc.: *See—*
Mitchell, Peter W. D.; and Blumenthal, Jack Herbert, 3,655,722.
International Harvester Company: *See—*
Fischer, Raymond C., 3,654,999.
Segredo, John D., 3,654,752.
Winker, Bernard L., 3,655,000.
International Nickel Company, Inc., The: *See—*
De Paul, Robert Allen, 3,655,366.
Snape, Edwin; and Schaller, Frank W., 3,655,465.
International Paper Company: *See—*
Leiter, Leigh D.; and Linda, Frank R., 3,655,860.
Schwenk, William E., 3,654,842.
International Standard Electric Corporation: *See—*
Sterling, Henley Frank; and Swann, Richard Charles George, 3,655,438.
International Telephone and Telegraph Corporation: *See—*
Beck, Roland D., 3,656,082.
Hirsch, Robert L., 3,655,508.
Marbury, Benjamin R.; Hestad, Alfred M.; and Reines, Jose, 3,655,918.
Smith, Harry R., 3,656,170.
Tabares, Gilbert; and Clifford, Joseph, 3,655,932.
International Tool Sales, Inc.: *See—*
Swisher, James A., 3,655,244.
Interscience Corporation: *See—*
Hamma, John C., 3,656,138.
Inventors Engineering Inc.: *See—*
Vik, Albam M., 3,654,875.
Ioffe, Benyamin Alexandrovich. Apparatus for conveying electrically conductive non-magnetic bodies by a magnetic field while simultaneously orienting the bodies. 3,656,075, Cl. 335-219.
Irvin Air Chute, Limited: *See—*
Bonn, Clifford; and Wilson, Kenneth R. A., 3,655,152.
Irvin, John Calhoun, to Bell Telephone Laboratories, Incorporated. Method of making semiconductor device components. 3,655,540, Cl. 204-143.
Ische, Friedrich: *See—*
Spietschka, Ernst; and Ische, Friedrich,3,655,670.
Spietschka, Ernst; and Ische, Friedrich,3,655,672.
ISE Electronics Corporation: *See—*
Tatsuta, Yoshio, 3,656,142.
Iselin, Beat: *See—*
Rossi, Alberto; Walter, Armin; Kessler, Werner; and Iselin, Beat,3,655,884.
Ishidoshiro, Hiroshi: *See—*
Sando, Yoshikazu; Tsuchihashi, Takashi; and Ishidoshiro, Hiroshi,3,655,328.
Ishii, Toshio: *See—*
Takamatsu, Yasuto; Ishii, Toshio; Hayami, Toshio; and Tsubota, Yoshiharu,3,655,887.
Isley, Ralph E., to Standard Oil Company, The (Ohio). Electrical capacitor having electricaliy- conductive, impervious connector. 3,656,027, Cl. 317-230.
Isono, Masao; Tomoda, Katsumi; Miyata, Kouichi; Maejima, Kazutaka; and Tsubaki, Keisuke, to Takeda Chemical Industries, Ltd. Detergent containing alkali protease. 3,655,570, Cl. 252-132.
Itek Corporation: *See—*
Buchan, William R., 3,655,266.
Johnston, Howard Ronald, 3,655,911.
Ito, Mikiji; Yamada, Kenji; and Noda, Kazuo, to Nippondenso Kabushiki Kaisha. Exhaust emission purifying device. 3,654,763, Cl. 60-294.
Ito, Yoichi: *See—*
Nakamura, Tutomu; Matsuda, Saburo; and Ito, Yoichi,3,655,988.
Ives, H. B., Company, The: *See—*
Coopersmith, Leo; and Woodman, Frank H., Jr., 3,655,228.
Iwami, Akira, to Mitsui Shipbuilding and Engineering Co., Ltd. Container supporting apparatus for container ship. 3,654,887, Cl. 114-72.
Iwasaki, Hidesuke: *See—*
Nakazawa, Koiti; Shibata, Motoo; Higashide, Eiji; Kanzaki, Toshihiko; Yamamoto, Hiroichi; Miyake, Akira; Ueyanagi, Jisaburo; and Iwasaki, Hidesuke,3,655,879.
Iwatsu Electric Company Limited: *See—*
Takahashi, Toru, 3,655,996.
Izumi, Mikio: *See—*
Kato, Tetsuji; Izumi, Mikio; Hayashibara, Yuji; and Suenaga, Kazuo,3,655,824.
Jackson, Byron, Inc.: *See—*
Langowski, Faustyn C.; and Turner, John W., Jr., 3,655,071.
Jackson, John C., Jr. Method of treating burned skin. 3,655,881, Cl. 424-144.
Jacoby, William F., to AMF Incorporated. Adjustable twin-strut handlebar construction. 3,655,219, Cl. 280-279.
Jacques, Pierre, to Raffinerie Tirlemontoise. Esters of alkoxylated saccharides. 3,655,645, Cl. 260-234.
Jacyno, Anthony; and Botefuhr, Harold R., to Murphy, G. W., Industries, Inc. Subframe for power tool having double insulated brush holders. 3,656,016, Cl. 310-50.
James, Ralph, Jr.: *See—*
Shelton, Marcus H.; and James, Ralph, Jr.,3,655,851.
Jamieson, Ernest J., to Cities Service Oil Company. Gasoline composition. 3,655,351, Cl. 44-66.
Jansen, James M., Jr., to United States of America, Atomic Energy Commission. Computer interface. 3,656,116, Cl. 340-172.5
Jansen, Karl, to Austin Company, The. Automatic molding apparatus and mold-making machine therein. 3,654,986, Cl. 164-173.
Janssen, Heinrich: *See—*
Schmalfeld, Paul; Sommers, Hans; and Janssen, Heinrich,3,655,518.
Jarvis, James G.: *See—*
Piper, Douglas E.; Jarvis, James G.; and Smith, Dale L.,3,654,893.
Jauvtis, Harvey I., to United States of America, Air Force. Bidirectional shift register. 3,656,126, Cl. 340-174.
Javaux, Gustave, to Glaverbel. Refractory block furnace wall. 3,655,356, Cl. 65-182.
Jeffers, James E., to Hoerner Waldorf Corporation. Protective corner pad. 3,655,112, Cl. 229-14.
Jefferson Chemical Company, Inc.: *See—*
Burns, Simon Pierce, 3,655,784.
Moss, Philip H.; and Cuscurida, Michael, 3,655,590.
Jeffreys, Kerry David: *See—*
Evans, Edward Michael; and Jeffreys, Kerry David,3,655,609.
Jehl, Thomas G.: *See—*
Libby, Richard L.; Moseley, Robin C.; Jehl, Thomas G.; Ruggirello, William A.; and Dunn, J. Stewart,3,656,131.
Jellco Mfg., Co.: *See—*
Jellinek, Frank J., 3,654,731.

Jellinek, Frank J., to Jellco Mfg., Co. Metal door frames. 3,654,731, Cl. 49-504.

Jenkins, Victor F.: *See—*
Fraser, James R.; and Jenkins, Victor F.,3,655,631.

Jensen, Norman P.; Shen, Tsung-Ying; and Windholz, Thomas B., to Merck & Co., Inc. Method of inhibiting the formation of phenylethanol- amine-N-methyl transferase with 2-aminobenzimidazoles. 3,655,901, Cl. 424-273.

Jernigan, Ernest D., Jr., to Industrial Nucleonics Corporation. Radiation gauge for monitoring sheet properties employing a scanned source. 3,655,979, Cl. 250-83.3

Jilbert, Philip Harvey, to United Kingdom Atomic Energy Authority. Interface detection apparatus having a side arm detector with three electrodes. 3,656,055, Cl. 324-61.

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Johns, Stanley K. Dispensing closure. 3,655,105, Cl. 222-484.

Johns-Manville Irrigation Corporation: *See—*
Davis, Wayne Edward, 3,656,024.

Johnson & Johnson: *See—*
Surpless, Susan R., 3,654,927.

Johnson, Arthur O. In-line fuel flow restricting and filter assembly. 3,655,059, Cl. 210-446.

Johnson, Douglas, to General Motors Corporation. Casing joint. 3,655,223, Cl. 285-39.

Johnson Gage Company, The: *See—*
Johnson, Stanley G., 3,654,892.

Johnson, George R., to Arpax Company , The. Resilient cushioning dunnage product for use in packaging and packing. 3,655,500, Cl. 161-104.

Johnson, James T., to Olin Corporation. Safety device for vehicles. 3,655,217, Cl. 280-150.

Johnson, John H.: *See—*
Fields, Joseph E.; and Johnson, John H.,3,655,509.

Johnson, John H.; and Richard, William R., Jr., to Monsanto Company. Polymeric organic phosphorus compounds. 3,655,593, Cl. 260-9.
Wharton, Ferdinand D.; Johnson, John H.; Fields, Joseph E.; and Machlin, Lawrence J.,3,655,869.

Johnson, Paul H., to Phillips Petroleum Company. Carbon black production. 3,655,341, Cl. 23-209.4

Johnson, Robert J.; and Zipper, Walter J., to Portion-Trol Liquor Systems, Inc. Liquid dispenser counting mechanism. 3,655,952, Cl. 235-94.

Johnson Service Company: *See—*
Laakaniemi, Richard N.; Munch, Otto R.; and Sorenson, Paul H., 3,654,944.

Johnson, Stanley G., to Johnson Gage Company, The. Zonal device and combination thereof with a dimensional dial indicator. 3,654,892, Cl. 116-129.

Johnston, Howard Ronald, to Itek Corporation. Automatic stereoplotting system. 3,655,911, Cl. 178-6.8

Johnston, Robert B.: *See—*
Alcock, Richard A.; Guthrie, Robert M.; and Johnston, Robert B.,3,654,784.

Johnston, Thomas Paterson: *See—*
Davies, George Edward; Dukes, Michael; and Johnston, Thomas Paterson,3,655,896.

Jones, Charles: *See—*
Hermes, Walter L.; and Jones, Charles,3,655,302.

Jones, Darrel R. Vacuum cup-held game device. 3,655,193, Cl. 273-106.

Jones, Kenneth R., to Globe-Union Inc. Method for the manufacture of batteries. 3,655,455, Cl. 136-175.

Jones, Robert W.: *See—*
O'Daniel, Stephen A.; Mott, Murray H.; and Jones, Robert W.,3,655,997.

Jones, William H.; and Hamilton, Martin W., to Dole Valve Company, The. Electronic weighing system for batching operations. 3,655,002, Cl. 177-70.

Josephson, Roy R., to Hercules Incorporated. Preparation of organomercury compounds. 3,655,707, Cl. 260-433.

Judson, George T.; and Freireich, Emil J., to United States of America, Health, Education and Welfare. Continuous flow blood separator. 3,655,123, Cl. 233-21.

Julia, Marc, to Rhone-Poulenc S.A. 2-Carboxy-4,4,6-trimethyl-2,5-heptadienoic acid. 3,655,620, Cl. 260-537.

Junggren, Ulf Krister: *See—*
Carlsson, Per Arvid Emil; Corrodi, Hans Rudolf; Hallhagen, Sven Goran; and Junggren, Ulf Krister,3,655,737.

Juranitch, John R. Blade sharpening guide. 3,654,823, Cl. 76-82.

K-D Manufacturing Company: *See—*
Mc Farland, Frederick R.; and Diffenderfer, Walter L., 3,654,686.

Kabushiki Kaisha: *See—*
Hoashi, Kenzo, 3,655,004.
Yamajima, Kaneo, 3,655,003.

Kabushiki Kaisha Hitachi Seisakusho: *See—*
Ichikawa, Kiyoshi; and Fujioka, Akira, 3,656,133.

Kabushiki Kaisha Komatsu Seisakusho (Komatsu Ltd.): *See—*
Aoyama, Ryozo; Koiwai, Akira; and Yamada, Kenji, 3,654,758.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See—*
Tanaka, Hiroshi; Naito, Shozo; and Shimizu, Tetsuji, 3,656,103.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Chiku, Takewo, 3,655,845.

Kabushikikaisha Tokyo Keiki Seizosho (Tokyo Keiki Seizosho Co., Ltd.): *See—*
Kawada, Shin-Ichi; Yoichi, Hirokawa; and Masuzawa, Isao, 3,656,043.

Kagawa, Tsuneo: *See—*
Tanaka, Masao; Kagawa, Tsuneo; Mochizuki, Kazuo; and Kohagura, Masahiro,3,655,514.

Kaiser, Carl; and Ross, Stephen T., to Smith Kline & French Laboratories. 4-Hydroxy-3-hydroxymethylphenyl-2- piperidinylcarbinols. 3,655,676, Cl. 260-293.84

Kaiser, Carl; and Zirkle, Charles L., to Smith Kline & French Laboratories. 1(2 Benzoylcyclopropymethyl)-4-phenyl piperozines. 3,655,667, Cl. 260-268.

Kaitna, Walter, to Wienerberger Ziegelfabriks- und Baugesellschaft. Hollow brick mold box. 3,655,322, Cl. 425-431.

Kalle Aktiengesellschaft: *See—*
Marx, Gerhard; and Heist, Hans, 3,654,896.

Kalner, Veniamin Davydovich: *See—*
Ostrovsky, Grigory Arkadievich; Orlovsky, Anatoly Georgievich; Nikonov, Vladimir Filippovich; Kalner, Veniamin Davydovich; Shklyarov, Isaak Nokhimovich; Stepin, Anatoly Loginovich; Bysink, Alexandr Moiseevich; Shepelyakovsky, Konstantin Zakharovich; and Smirnov, Stanislav Ivanovich,3,655,466.

Kaltenbach & Voigt: *See—*
Loge, Hans, 3,654,911.

Kamardin, Vladimir Alexandrovich: *See—*
Polyakov, Georgy Filippovich; Vanin, Vladimir Lvovich; and Kamardin, Vladimir Alexandrovich,3,655,209.

Kamena, David H., to Pneumatic Systems Inc. Automatic control system for sewing machines. 3,654,882, Cl. 112-121.11

Kampe, Marcis M., to Enthone, Incorporated. Alkaline bright zinc electroplating. 3,655,534, Cl. 204-55.

Kanda, Kaoru; and Kobayashi, Tadahiro, to Fujitsu, Limited. Writing checking system. 3,656,125, Cl. 340-174.1

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Kane, Neil G., to Rain Bird Sprinkler Mfg., Corporation. Adjustable cam and adjusting means therefore. 3,654,817, Cl. 74-568.

Kano, Tsuyoshi; Otomo, Yoshiro; and Yamamoto, Hajime, to Hitachi, Ltd. Phosphors. 3,655,577, Cl. 252-301.4

Kanoh, Teruchika; and Notomi, Ryota, to Kohjin Company, Limited. Method and apparatus for making tubular film. 3,655,846, Cl. 264-89.

Kansai Paint Company, Limited: *See—*
Kozu, Haruo; Kimura, Morio; Watanabe, Tadashi; Naozumi, Hiratsuka; and Yoshida, Michio, 3,655,596.

Kanzaki, Toshihiko: *See—*
Nakazawa, Koiti; Shibata, Motoo; Higashide, Eiji; Kanzaki, Toshihiko; Yamamoto, Hiroichi; Miyake, Akira; Ueyanagi, Jisaburo; and Iwasaki, Hidesuke,3,655,879.

Kaplow, Milton: *See—*
Cseri, Joseph; Halik, Joseph John; and Kaplow, Milton,3,655,400.
Glasser, George; Hollis, Frank; and Kaplow, Milton,3,655,404.

Karas, Albert J.; and Vey, John E., to McCormick & Company, Inc. Souffle mix. 3,655,405, Cl. 99-94.

Karnemaat, John N. Process for treating waste materials. 3,655,395, Cl. 99-2.

Kashio, Toshio; and Kashio, Toshio, to Casio Computer Kabushiki Kaisha Casio Computer Kabushiki Kaisha. Method and apparatus for writing characters Method and apparatus for writing characters. 3,656,169, Cl. 346-1.

Kasperik, Archibald S.; and Fuchs, Herbert A., to Signal Oil and Gas Company. Adding mercaptan sulfur to a selective hydrogenation process. 3,655,621, Cl. 260-677.

Kassel, Aaron, to Technicon Instruments Corporation. Fluid supply control method and apparatus for periodic, precise fluid merger. 3,654,959, Cl. 137-605.

Katayose, Kazunobu: *See—*
Higuchi, Shunichiro; and Katayose, Kazunobu,3,655,018.

Kato, Kotaro, to Nippon Electric Company, Limited. Code conversion system. 3,656,150, Cl. 340-347.

Kato, Tetsuji; Izumi, Mikio; Hayashibara, Yuji; and Suenaga, Kazuo, to Mitsubishi Rayon Co., Ltd.Rubbery acrylic resin composition containing a resinous 4,4'-dioxy diarylalkane polycarbonate. 3,655,824, Cl. 260-873.

Katsuragawa Denki Kabushiki Kaisha: *See—*
Kinoshita, Koichi, 3,655,369.

Katsuragawa Kenki Kabushiki Kaisha: *See—*
Furuichi, Masayoshi; Miyakawa, Seiichi; and Masuda, Nobuchika, 3,656,021.

Katzman, Frederick. Above ground swimming pool construction. 3,654,640, Cl. 4-172.19

Kauder, Otto S.; Leistner, William E.; and Hecker, Arthur C., to Argus Chemical Corporation. Polycarbocyclic phenolic phosphites. 3,655,832, Cl. 260-930.

Kaufman, Herman S.: *See—*
Mueller, Max B.; Salatiello, Peter P.; and Kaufman, Herman S.,3,655,611.

Kaupp, Josef, to Farbwerke Hoechst Aktiengesellschaft, vormals Meister Lucius & Bruning. Process for the manufacture of polyester resins. 3,655,820, Cl. 260-861.

Kawada, Shin-Ichi; Yoichi, Hirokawa; and Masuzawa, Isao, to Kabushikikaisha Tokyo Keiki Seizosho (Tokyo-Keiki Seizosho Co., Ltd.). Steering system with automatic increase of rate time. 3,656,043, Cl. 318-588.

Kawaura, Hirosi: *See—*
Mase, Takehisa; Kawaura, Hirosi; Yamaguchi, Terumoto; and Amano, Yosinao,3,655,142.

Kay, Edward L.; and Beckman, Joseph A., to Firestone Tire & Rubber Company, The. Rubber accelerators for liquid compounding. 3,655,599, Cl. 260-23.7

Kay, Nicholas L.: *See—*
Hass, Robert H.; Helfrey, Paul F.; and Kay, Nicholas L.,3,655,551.

Kean, Chester E.: *See—*
Schwer, Frederick W.; and Kean, Chester E.,3,655,442.

Keefer, Richard D.; and Wyman, John S., Jr., to Bendix Corporation, The, mesne. Gas sampling device. 3,654,801, Cl. 73-28.

Kefilas, John H., to Honeywell Inc. Electroless plating of filimentary magnetic records. 3,655,441, Cl. 117-237.

Keig, George A.; Smith, James C.; and Watts, John M. J., to Union Carbide Corporation. Asteriated synthetic corundum gem stones and method and apparatus for their production. 3,655,415, Cl. 106-42.

Keil, Gunter: *See—*
Hoyer, Hans; Keil, Gunter; and Happe, Wilhelm,3,655,844.

Keller, Siegfried, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Anti-slip device for compressed air brakes, particularly for rail vehicles. 3,655,246, Cl. 303-21.

Keller, Wolfgang: *See—*
Longo, Hans-Eberhard; Keller, Wolfgang; and Vogel, Carl-Heinz,3,655,345.

Kelly, Peter E.: *See—*
Corman, James C.; and Kelly, Peter E.,3,656,035.

Kelly, Samuel H.: *See—*
Hill, Forrest G.; and Kelly, Samuel H.,3,654,863.

Kelly, Vincent M., Jr. Non-cumulative-force spring for orthodontic devices. 3,654,702, Cl. 32-14.

Kemerer, Douglas W.; and Pomeranz, Jehoshua N., to International Business Machines Corporation. Bipolar capacitor driver. 3,656,004, Cl. 307-246.

Kemp, Gordon Arthur; Bachmann, Howard John; Berkelhammer, Gerald; and Asato, Goro, to American Cyanamid Company. Compositions containing 3,6-disubstituted symmetrical tetrazines, salts thereof and method of use thereof. 3,655,890, Cl. 424-244.

Kennecott Copper Corporation: *See—*
Polinsky, Samuel M.; and Schellinger, Alfred K., 3,655,337.

Kennedy , Kurt D.: *See—*
Firestone, Alexander H.; Fisk, Robert W.; and Kennedy , Kurt D.,3,655,902.

Kennedy, Melvin R.: *See—*
Beny, Janos; Bosley, Denis V.; and Kennedy, Melvin R.,3,654,728.

Kennedy, Robert M.: *See—*
Wilson, Kenneth R.; and Kennedy, Robert M.,3,655,696.

Kerb, Ulrich: *See—*
Furst, Andor; Furlenmeiter, Andre; Langemann, Albert; Waldvogel, Guy; Hocks, Peter; Kerb, Ulrich; and Wiechert, Rudolf,3,655,650.

Kermath Manufacturing Corporation: *See—*
Moore, Robert M.; Lauterbach, Norman H.; and Armstrong, David P., 3,655,968.

Kerwin, Robert Eugene,: *See—*
Curran, Robert Kyran; Kerwin, Robert Eugene,; and Shankoff, Theodore Arthur,3,655,527.

Kessler, Werner: *See—*
Rossi, Alberto; Walter, Armin; Kessler, Werner; and Iselin, Beat,3,655,884.

Keunecke, Gerhard: *See—*
Gehrken, Hubert; Helms, Gerd; Keunecke, Gerhard; and Krimphove, Herbert,3,655,521.

Khelghatian, Habet M.: *See—*
Poppe, Wassily; Khelghatian, Habet M.; and Fitzpatrick, James E.,3,655,433.

Kidde, Walter & Company, Inc.: *See—*
Hazlewood, Lewis F., 3,654,931.

Kiengle Apparate GmbH: *See—*
Spausuzus, Siegfried, 3,655,948.

Kienitz, Martin E., to Smith Kline Instruments, Inc. Apparatus for monitoring the dispensing of liquid. 3,655,095, Cl. 222-39.

Kiernan, Henry E., to Hydro-Stack Mfg. Corporation. Modular hydraulic system. 3,654,960, Cl. 137-608.

Kierstead, Richard Wightman; and Rosen, Perry, to Hoffmann-La Roche Inc. Process for producing 4, 6-dihalopregna-4,6-diene. 3,655,653, Cl. 260-239.55

Kieserling, Th., & Albrecht: *See—*
Brauer, Hans, 3,654,789.

Killea, John Francis, Jr. Impact bumper. 3,655,231, Cl. 293-86.

Kimberly-Clark Corporation: *See—*
Duchane, David V., 3,654,928.
Goldbeck, Leroy J.; and Van Den Elzen, Norbert L., 3,655,422.

Kimura, Kazuo: *See—*
Tanaka, Katsunobu; and Kimura, Kazuo,3,655,510.

Kimura, Morio: *See—*
Kozu, Haruo; Kimura, Morio; Watanabe, Tadashi; Naozumi, Hiratsuka; and Yoshida, Michio,3,655,596.

Kimura, Tadao, to Lead Metal Kogyo Kabushiki Kaisha. Method of discharge forming bulged articles. 3,654,788, Cl. 72-56.

Kind, Guntram; Schroder, Karl-Heinz; and Busse, Rido, to Pulsotronic Merten KG. Separating device for separating metallic matter from non-metallic matter. 3,655,039, Cl. 209-74.

King, Ansel A. Battery charging apparatus. 3,656,044, Cl. 320-2.

Kingsbury, Keith M., to Motorola, Inc. Minimum size transponder. 3,656,159, Cl. 343-6.8

Kingston, William. Fish bait dispenser. 3,654,725, Cl. 43-44.99

Kinkaid, Robert John, to AMP Incorporated. Electrical connectors. 3,656,093, Cl. 339-217.

Kinnicutt, Roger, Jr.; and Hill, William J., to Morgan Construction Company. Coil transfer and tipping apparatus. 3,655,079, Cl. 214-146.5

Kinoshita, Koichi, to Katsuragawa Denki Kabushiki Kaisha. Persistent internal polarization process in electrophotography. 3,655,369, Cl. 96-1.

Kintner, Paul M.: *See—*
Greening, Donald J.; Kintner, Paul M.; and Strand, Sanford M.,3,655,950.

Kinzer, William K.: *See—*
Reed, William A.; Kinzer, William K.; Swanson, John J.; and Kusner, Robert E.,3,655,837.

Kirsch, Francis W.; Potts, John D.; and Barmby, David S., to Sun Oil Company. Continuous alkylation process. 3,655,813, Cl. 260-683.43

Kirsch, Wolff M.: *See—*
Newkirk, John B.; Predecki, Paul K.; and Kirsch, Wolff M.,3,654,932.

Kirschbaum, Larry E. Apparatus for mounting camper body on a pickup truck. 3,655,234, Cl. 296-23.

Kiss, William F.: *See—*
Gilson, Russell A.; Kiss, William F.; and Organic, Vincent J.,3,656,002.

Kitamura, Shige Yoshi; Hirai, Hajime; Okuno, Yositosi; and Fujimoto, Keimei, to Sumitomo Chemical Company, Ltd. Diphenylethylene derivatives. 3,655,654, Cl. 260-240.

Klahre, Guenter: *See—*
Seitz, Karl; Klahre, Guenter; and Riat, Henri,3,655,662.

Klamer, Reuben: *See—*
Grant, Perry J., 3,655,191.

Klamer, Reuben, & Associates: *See—*
Grant, Perry J., 3,655,191.

Klaui, Heinrich, to Hoffmann-La Roche Inc. Carotenoid compositions. 3,655,406, Cl. 99-148.

Klayman, Daniel L.; and Gilmore, W. Franklin, to United States of America, Army. Synthesis of N-substituted 2-aminoethanethiosulfuric acids. 3,655,715, Cl. 260-453.

Klebert, Wolfgang: *See—*
Becker, Gustav; Griepentrog, Heinz; Klebert, Wolfgang; and Reich, Friedrich,3,655,437.

Klimpl, Fred E.: *See—*
Bastone, Andrew L.; Boeker, Justin R.; and Klimpl, Fred E.,3,655,468.

Klopach, Robert T.; Bohar, Joseph; Klopach, Robert T.; Bohar, Joseph; Klopach, Robert T.; and Bohar, Joseph, to American Electronic Laboratories, Inc. American Electronic Laboratories, Inc. Broadband circularly polarized omnidirectional antenna Broadband circularly polarized omnidirectional antenna Broadband circularly polarized omnidirectional antenna. 3,656,166, Cl. 343-756.

Klose, Frederick M.: *See—*
Reimer, George M.; and Klose, Frederick M.,3,654,883.

Knapp, Kenneth K., to Abex Corporation. Hydraulic control systems. 3,654,837, Cl. 91-461.

Knapsack Aktiengesellschaft: *See—*
Sennewald, Kurt; Vogt, Wilhelm; Erpenbach, Heinz; and Glaser, Hermann, 3,655,747.

Knapsack-Griesheim Aktiengesellschaft: *See—*
Kribbe, Kurt Willi Harri, 3,655,334.

Knoche, Richard C.: *See—*
Ballsmith, George C.; and Knoche, Richard C.,3,654,975.

Kobayashi, Akio: *See—*
Ohno, Isamu; Kobayashi, Akio; Ohte, Akira; Tamuki, Minoru; and Ohta, Susumu,3,655,992.

Kobayashi, Kazuhiko: *See—*
Saito, Nagao; Kobayashi, Kazuhiko; and Niwa, Susumu,3,655,936.

Kobayashi, Tadahiro: *See—*
Kanda, Kaoru; and Kobayashi, Tadahiro,3,656,125.

Kobylak, Anthony M.: *See—*
Bode, Wolfgang W.; Dunlap, Glenn H.; Kobylak, Anthony M.; Richards, Raymond S.; and Pfaender, Lawrence V.,3,654,680.

Koch, Bradley R., to Melpar, Inc. Digital automatic speed control for railway vehicles. 3,655,962, Cl. 246-182.

Koch, Richard C.: *See—*
Howes, Harold L., Jr.; and Koch, Richard C.,3,655,891.

Kockum Soderhamn AB: *See—*
Andersson, Curt Erik Ingvar, 3,655,073.

Koehring Company: *See—*
Thompson, Glenn S., 3,654,839.

Koenecke, William J.; and Lazar, Joel R., to Metal Improvement Company, Inc. Metal surface treating apparatus for internal surfaces. 3,654,786, Cl. 72-53.

Koerner, Gotz: *See—*

Fink, Hans-Ferdi; Koerner, Gotz; Rossmy, Gerd; and Schmidt, Gunter,3,655,554.
Rossmy, Gerd; and Koerner, Gotz,3,655,555.

Koff, Arnold; and Magid, Louis, to Hoffmann-La Roche Inc. Method of forming a stable vitamin E-C granulation. 3,655,852, Cl. 264-115.

Kohagura, Masahiro: *See—*
Tanaka, Masao; Kagawa, Tsuneo; Mochizuki, Kazuo; and Kohagura, Masahiro,3,655,514.

Kohjin Company, Limited: *See—*
Kanoh, Teruchika; and Notomi, Ryota, 3,655,846.

Kohler Co.: *See—*
Pratt, Aloysius W., 3,656,051.

Kohn, Gustave K., to Chevron Research Company. Method for isomerizing phenylphenols. 3,655,778, Cl. 260-619.

Kohn, Gustave K.; and Stevick, Lawrence E., to Chevron Research Company. Isomerization process. 3,655,780, Cl. 260-624.

Koiwai, Akira: *See—*
Aoyama, Ryozo; Koiwai, Akira; and Yamada, Kenji,3,654,758.

Kolobielski, Marjan, to United States Steel Corporation. Interpolycarbonates from 9,10-bis (hydroxymethyl)- s-octahydroanthracene-bis (alkyl or aryl carbonates). 3,655,626, Cl. 260-77.5

Kono, Reisaku; Yamamoto, Shigeo; and Yaoi, Hideaki, to Takeda Chemical Industries, Ltd. Highly attenuated rubella virus vaccine and production thereof. 3,655,872, Cl. 424-89.

Konrad, Charles E., to General Electric Company. Direct current control circuit. 3,656,039, Cl. 318-138.

Kookootsedes, Gust J.: *See—*
Antonen, Robert C.; and Kookootsedes, Gust J.,3,655,598.

Koppers Company, Inc.: *See—*
Williams, Charles H., 3,654,775.

Kornfeld, Bessie: *See—*
Bleecker, Albert B.,3,655,367.

Kosciolek, Joseph H.: *See—*
Dierdorff, Lee H., Jr.; and Kosciolek, Joseph H.,3,655,698.

Kosonocky, Walter Frank: *See—*
Rajchman, Jan Aleksander; and Kosonocky, Walter Frank,3,656,121.

Kosowan, Michael B.: *See—*
DuRocher, Gideon A.; and Kosowan, Michael B.,3,655,240.

Koss, Louis J., to Capital Machine Company, Inc. Hydraulically controlled pressure cap. 3,654,973, Cl. 144-178.

Kotzar, Andrew J.: *See—*
Singer, Robert B.; Muir, Earl B.; and Kotzar, Andrew J.,3,654,822.

Koushuha-Netsuren Kabushiki Kaisha: *See—*
Mizuma, Katsuhisa, 3,654,968.

Kovacs, Imre. Splatter shield and bumper for paint roller. 3,654,658, Cl. 15-248.

Kozu, Haruo; Kimura, Morio; Watanabe, Tadashi; Naozumi, Hiratsuka; and Yoshida, Michio, to Kansai Paint Company, Limited. Short oil alkyd resins. 3,655,596, Cl. 260-22.

Kracklauer, Aloysius C., to Sparkler Manufacturing Company. Method and apparatus for retaining and dislodging filter cake. 3,655,049, Cl. 210-81.

Kraft, Karl-Josef: *See—*
Wingler, Frank; Dietrich, Werner; Bartl, Herbert; and Kraft, Karl-Josef,3,655,589.

Kramer, Feodor Otto: *See—*
Brunnee, Kurt; and Kramer, Feodor Otto,3,655,963.

Kramer, Walter R.: *See—*
Stenger, Vernon A.; and Kramer, Walter R.,3,655,333.

Krass, Morton; and Nelson, Walter, said Nelson assor. to said Krass. Self-supporting cart. 3,655,212, Cl. 280-36.

Kratzke, Albert W.: *See—*
Worden, John R.; and Kratzke, Albert W.,3,654,809.

Krause, John Thorvald; and Kurkjian, Charles Robert, to Bell Telephone Laboratories, Incorporated. Acousto-optic and ultrasonic devices using germanium containing chalcogenide glasses. 3,655,255, Cl. 350-1.

Krawszik, Theodor: *See—*
Lenk, Erich; and Krawszik, Theodor,3,655,314.

Krenzer, John; and Richter, Sidney B., to Velsicol Chemical Corporation. N,O-Dicarbamoyl-N-phenylhydroxylamines. 3,655,751, Cl. 260-545.

Kreske, Walter J.: *See—*
Ludwig, David R.; and Sherman, David A., 3,656,072.

Kretzschmar, Karl: *See—*
Loos, Herbert; and Kretzschmar, Karl,3,654,791.

Kribbe, Edith, nee Kukrt: *See—*
Kribbe, Kurt Willi Harri,3,655,334.

Kribbe, Gertrud Katharina, nee Handardt: *See—*
Kribbe, Kurt Willi Harri,3,655,334.

Kribbe, Heinrich: *See—*
Kribbe, Kurt Willi Harri,3,655,334.

Kribbe, Kurt Willi Harri, deceased0 (by Kribbe, Gertrud Katharina, nee Handardt0Kribbe, Heinrich0Kribbe, Edith, nee Kukrt0Harnisch, Heinz0Cremer, Joseph; heirs), to Knapsack-Griesheim Aktiengesellschaft. Method for producing alkali metal and/or alkali earth-metal phosphates. 3,655,334, Cl. 23-106.

Krimphove, Herbert: *See—*
Gehrken, Hubert; Helms, Gerd; Keunecke, Gerhard; and Krimphove, Herbert,3,655,521.

Kroc, Robert L.; and Mischler, Terrence W., to Warner-Lambert Company. Quinestrol as a rodent control agent. 3,655,889, Cl. 424-238.

Krock, Richard H.: *See—*
Griffiths, Leonard B.; and Krock, Richard H.,3,655,447.

Krohn, Ivar T.; Page, Geoffrey A.; and Reinis, Gedeminas J., to Xerox Corporation. Image reversal in manifold imaging. 3,655,372, Cl. 96-1.3

Kronig, Walter; and Grolig, Johann, to Farbenfabriken Bayer Aktiengesellschaft. Process for the preparation of cyclohexanone oxime. 3,655,759, Cl. 260-566.

Krueger, Clement E. Bird feeder. 3,654,904, Cl. 119-18.

Krug, Hans-Dietrich; Lucas, Robert Armistead; Blatter, Herbert Morton; Lucas, Robert Armistead; and Blatter, Herbert Morton, to Freudenberg, Carl Ciba Corporation. Process for the manufacture of foam-plastic articles covered with a protective film Methods of treatment using 2-acylimino-1,3- diazacycloalkanes Methods of treatment using 2-acylimino-1,3- diazacycloalkanes. 3,655,840, Cl. 424-251.

Krumkalns, Eriks V.; and Taylor, Harold M., to Lilly, Eli, and Company. Plant growth control. 3,655,359, Cl. 71-94.

Krzyzanowski, Erich: *See—*
Wittmoser, Adalbert; Schade, Johannes; and Krzyzanowski, Erich,3,654,987.

Kubota, Yasuharu, to Sony Corporation. Color television camera. 3,655,909, Cl. 178-5.4

Kuebler, Thomas L. Cam and ice machine combination. 3,654,771, Cl. 62-352.

Kuechler, William L.: *See—*
Chung, Seng Fang; Kuechler, William L.; Steinbronn, George J.; Chung, Seng Fang; Kuechler, William L.; Steinbronn, George J.; Chung, Seng Fang; Kuechler, William L.; and Steinbronn, George J.,3,656,177.

Kuehn, Andrew, III, to Systematics, Inc. Capacitor discharge ignition circuit. 3,654,910, Cl. 123-148.

Kuhn, Wilfried: *See—*
Rudolph, Otfried; and Kuhn, Wilfried,3,654,861.

Kulbersh, Irwin R.: *See—*
Ferdinand, Irwin J.; and Kulbersh, Irwin R.,3,654,879.

Kumai, Akira; and Ogawa, Yasuhisa, to Fuji Photo Film Co., Ltd. Process for the production of dispersions of colloidal silver. 3,655,412, Cl. 106-1.

Kunogi, Mahito, to Meiki Seisakusho, Ltd. Plastic injection molding apparatus. 3,655,313, Cl. 425-130.

Kuraray Co., Ltd.: *See—*
Ohfuji, Yoshio; and Eguchi, Tamotsu, 3,655,632.
Tsutsumi, Mitsutoshi, 3,655,363.

Kuratomi, Tatsuo. Method of manufacturing diamond crystals. 3,655,340, Cl. 23-209.1

Kurhajec, George A.; and Neuvar, Erwin W., to Minnesota Mining & Manufacturing Company. Iminocarbonyl derivatives. 3,655,758, Cl. 260-566.

Kurkjian, Charles Robert: *See—*
Krause, John Thorvald; and Kurkjian, Charles Robert,3,655,255.

Kurokawa, Kaneyuki: *See—*
Beccone, John Peter; Kurokawa, Kaneyuki; and Schlosser, Wolfgang Otto,3,656,069.

Kusner, Robert E.: *See—*
Reed, William A.; Kinzer, William K.; Swanson, John J.; and Kusner, Robert E.,3,655,837.

Kutik, Louis F.; and Gronemeyer, Erich W. Apparatus for making progressive injection molded sheet. 3,655,308, Cl. 425-109.

Kutter, Eberhard: *See—*
Reuter, Wolfgang; Kutter, Eberhard; Sauter, Robert; Machleidt, Hans; and Wildfeuer, Alexander,3,655,685.

Kutzenco, Jack: *See—*
Goldstein, Milton; Hair, George R.; Kutzenco, Jack; and Marchand, Jacques J.,3,655,488.

Kuwazaki, Masahiro: *See—*
Yamamoto, Shohei; Watanabe, Jun; Hosoi, Susumu; Kuwazaki, Masahiro; Ota, Akira; Takata, Toshikatsu; and Asaoka, Junichi,3,655,449.

Kyminas, Stanley C.: *See—*
Medica, Joseph J.; Trout, Kenneth G.; and Kyminas, Stanley C.,3,655,594.

Kyowa Hakko Kogyo Co., Ltd.: *See—*
Tanaka, Katsunobu; and Kimura, Kazuo, 3,655,510.
Tanaka, Masao; Kagawa, Tsuneo; Mochizuki, Kazuo; and Kohagura, Masahiro, 3,655,514.

Laakaniemi, Richard N.; Munch, Otto R.; and Sorenson, Paul H., to Johnson Service Company. Fluid mixing control apparatus. 3,654,944, Cl. 137-81.5

Laane, Rein Raymond, to Bell Telephone Laboratories, Incorporated. Bilateral electrical communication switching network. 3,655,919, Cl. 179-18.

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Labat, Yves, to Societe Nationale des Petroles d'Aquitaine Tour Aquitaine. Method for producing low molecular weight thiothers. 3,655,774, Cl. 260-609.

Labelle, Henri Marcel Robert, to Dynaflair Corporation Ltd. Protective grille. 3,654,982, Cl. 160-199.

Laboratories Jacques Logeais: *See—*
Maillard, Jacques George, 3,655,673.

LaCroce, Leonard Thomas, to American Can Company. Full-open end closure provided with distortion resistant shoulder in countersink wall. 3,655,091, Cl. 220-54.

Lacroix, Flora L. Clothing sleeve. 3,654,632, Cl. 2-125.

Ladney, Michael, Jr.: *See—*
Wild, Robert G.,3,655,549.

Lafon, Victor, to Societe Anonyme dite: Orsymonde. Phloroglucinol derivatives. 3,655,776, Cl. 260-613.

Laidlaw, George M.: *See—*
Ackerman, James H.; and Laidlaw, George M.,3,655,752.

Laine, Robert E.: *See—*
Runge, Wallace F.; and Laine, Robert E.,3,655,781.

Laizier, Jacques: *See—*
Icre, Pierre; and Laizier, Jacques,3,655,965.

Lana, Garnet L. Nail screw fastening system. 3,654,832, Cl. 85-45.

Land, Edwin H.; and Land, Edwin H., to Polaroid Corporation Polaroid Corporation. Motion-picture system Motion-picture system. 3,655,277, Cl. 352-72.

Landis Tool Company: *See—*
McIntosh, Michael D., 3,655,957.

Landry, Thomas J., to AMP Incorporated. Tray and pan supporting rack. 3,655,063, Cl. 211-71.

Lane, Edward Sydney: *See—*
Hardy, Clarence James; Lane, Edward Sydney; and Hannam, Mervyn John,3,655,418.

Lane, Frank B.; and Fulmer, George M., to Gichner Mobile Systems, Inc. Load carrier with elevatable load engaging surface. 3,655,214, Cl. 280-43.18

Lane, John. Display device. 3,654,717, Cl. 40-126.

Lane, William Charles: *See—*
Smith, Michael John; and Lane, William Charles,3,654,745.

Lang, Alphonse Gregory, Jr., to Ceramic Magnetics, Inc. Pre-formed multiple track magnetic head assembly. 3,655,923, Cl. 179-100.2

Lang, James W. Mobile, containerized dispenser for flowable materials. 3,655,137, Cl. 239-670.

Langdon, Jack L., to International Business Machines Corporation. Construction of monolithic chip and method of distributing power therein for individual electronic devices constructed thereon. 3,656,028, Cl. 317-235.

Langemann, Albert: *See—*
Furst, Andor; Furlenmeiter, Andre; Langemann, Albert; Waldvogel, Guy; Hocks, Peter; Kerb, Ulrich; and Wiechert, Rudolf,3,655,650.

Langer, Arthur W., Jr., to Esso Research and Engineering Company. Process for producing linear alpha olefins. 3,655,812, Cl. 260-683.15

Langowski, Faustyn C.; and Turner, John W., Jr., to Jackson, Byron, Inc. Horizontal pipe racking and handling apparatus. 3,655,071, Cl. 214-2.5

Lanier, Leo H. Oyster opening machine. 3,654,666, Cl. 17-76.

Lankheet, Jay A., to Glamour Pools Company. Above ground pool units with foldable side panel, deck and fence. 3,654,639, Cl. 4-172.19

Laporte Industries Limited: *See—*
Fraser, James R.; and Jenkins, Victor F., 3,655,631.

Larson, Allen E.: *See—*
Hoffman, William D.; and Larson, Allen E.,3,655,414.

Larson, Clarence E.; and Dawley, Richard H., to Martin-Marietta Corporation. Constant volume discharge gate. 3,655,104, Cl. 222-317.

Larsson, Bjorn E.: *See—*
Souder, Louis C.; Larsson, Bjorn E.; and Ryan, Charles F.,3,655,825.

Laser, Georges; and Bornet, Daniel, to Alsthom-Savoisienne. Distribution of equipotential surfaces of inductance windings comprising layers with a double series of steps. 3,656,077, Cl. 336-84.

Lassau, Christian; and Sajus, Lucien, to Institut Francais du Petrole des Carburants et Lubrifiants. Process for hydrogenation unsaturated organic compounds. 3,655,799, Cl. 260-666.

Lastovenko, Valentin Andreevich: *See—*
Portyanko, Andrei Ivanovich; Lastovenko, Valentin Andreevich; Dudka, Viktor Vasilievich; Rodenko, Fedor Leontievich; Onischenko, Grigory Ivanovich; Vatkin, Adolf Semenovich; Pokusa, Alexei Alexandrovich; and Ruzin, Ivan Mikhailovich,3,654,997.

La Telemecanique Electrique: *See—*
Orts, Joseph, 3,655,154.

Lauterbach, Norman H.: *See—*
Moore, Robert M.; Lauterbach, Norman H.; and Armstrong, David P.,3,655,968.

Lax, Benjamin, to Massachusetts Institute of Technology. Laser device. 3,655,986, Cl. 250-199.

Layman, Harry D.; and Taylor, Robert E., to Sylvania Electric Products, Inc. Production of calcium halophosphate phosphors. 3,655,576, Cl. 252-301.6

Lazar, Jeffrey Michael, to ACF Industries, Inc., mesne. Fluidic carburetor. 3,655,170, Cl. 261-36.

Lazar, Joel R.: *See—*
Koenecke, William J.; and Lazar, Joel R.,3,654,786.

Lazarus, Stanley David: *See—*
Meneghini, Carlo; Mayer, Richard Eugene; Lazarus, Stanley David; and Rainer, Norman Barry,3,654,679.

Lea, Charles A.; and Lea, Charles A., to Plessey Company, The Plessey Company, The. Dipole radio antennae Dipole radio antennae. 3,656,167, Cl. 343-793.

Lea, Charles A.: *See—*
Lea, Charles A.; and Lea, Charles A.,3,656,167.

Lead Metal Kogyo Kabushiki Kaisha: *See—*
Kimura, Tadao, 3,654,788.

Lear Siegler, Inc.: *See—*
Skalsey, Lily G., 3,654,797.

Leathers, Claude L. Environmental test bed assembly for miniature electronic components. 3,656,058, Cl. 324-158.

Leblond, Jean; Biet, Jean; and Danneels, Guy, to Uniroyal Englebert France S.A. Tire building machine. 3,654,828, Cl. 83-23.

Lee, Art, to General Electric Company. Two circuit solid state limit switch (1NO and 1NC). 3,656,005, Cl. 307-247.

Lee, Byron D. Foldable crib. 3,654,645, Cl. 5-99.

Lee, Kyu Tai; and Whitney, Joel G., to Du Pont de Nemours, E. I., and Company. Novel α-pyrones. 3,655,694, Cl. 260-343.2

Lee, Paul R., to Essex International, Inc. Thermostatic switch. 3,656,079, Cl. 337-102.

Leeds & Northrup Company: *See—*
Staley, Walton F., Jr.; and Staley, Walton F., Jr., 3,656,176.
Staley, Walton F., Jr.; and Staley, Walton F., Jr., 3,656,176.

Lefebvre, Gilles: *See—*
Chauvin, Yves; Lefebvre, Gilles; and Uchino, Masahiro,3,655,810.

Leffingwell, John Charles, to Reynolds, R. J., Tobacco Company. Isophorone derivatives having a nitrile-containing substituent in the 4-position. 3,655,720, Cl. 260-464.

Lefort, Marcel: *See—*
Bazouin, Andre; and Lefort, Marcel,3,655,710.

Le Grow, Gary E., to Dow Corning Corporation. Silacyclopentane thiols and thiolates. 3,655,713, Cl. 260-448.

Lehman, Harry W., to Stratford Industries, Inc. Adjustable door or window frame. 3,654,734, Cl. 49-505.000

Lehmann, Hans-Gunter; Zollner, Georg; and Wiechert, Rudolf, to Schering Aktiengesellschaft. 14β-Hydroxy-15α-acyloxy-cardenolides. 3,655,643, Cl. 260-210.5

Lehrer, Alexander, to Litton Systems, Inc. Ship transfer system. 3,654,869, Cl. 104-114.000

Lehureau, Jean: *See—*
Borrel, Philippe; and Lehureau, Jean,3,655,483.

Leibhard, Erich: *See—*
Trattner, Herman; and Leibhard, Erich,3,654,897.

Leighton, Peter Watson, to Lucas, Joseph, (Industries) Limited. Electrical switches. 3,655,933, Cl. 200-159.

Leistner, William E.: *See—*
Kauder, Otto S.; Leistner, William E.; and Hecker, Arthur C.,3,655,832.

Leisure Group, Inc., The: *See—*
Rosic, Richard F., 3,655,132.

Leiter, Leigh D.; and Linda, Frank R., to International Paper Company. Method for constructing handle of thermoplastic material. 3,655,860, Cl. 264-237.

Lelugas, Joseph J., to American Hospital Supply Corporation. Physician's examining table upholstered top construction. 3,655,179, Cl. 269-324.

Lemanski, Savarian F. Tool holder and attachments for a lathe. 3,654,827, Cl. 82-25.

Lemke, Timothy Allen: *See—*
Swengel, Robert Charles, Sr.; and Lemke, Timothy Allen,3,656,092.

Lemon, George E. Tethered ball with cord lengthening means. 3,655,190, Cl. 273-95.

Lengnick, Guenther Fritz; and Lengnick, Guenther Fritz, to Stauffer-Wacker Silicone Corporation, mesne Stauffer-Wacker Silicone Corporation, mesne. Organophosphato-stannanes Organophosphato-stannanes. 3,655,705, Cl. 260-429.7

Lenk, Erich; and Krawszik, Theodor, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Spinning apparatus composed of modular spinning units on common heating beam. 3,655,314, Cl. 425-131.

Les Entreprises Vezina, Jean A., Ltee.: *See—*
Vezina, Jean A., 3,655,178.

Levenberg, Bruce: *See—*
Roon, Robert J.; and Levenberg, Bruce,3,655,516.

Lever Brothers Company: *See—*
Vinson, Leonard J.; and Masurat, Thomas, 3,655,416.

Levine, Richard C., to Diecomp Inc. Frequency division multiplex system using the spectrum of a periodic synchronizing pulse for phase correction. 3,655,917, Cl. 179-15.

Levy, Newton, Jr.: *See—*
Rettew, Richard Raymond; Wirth, David Griffith, Jr.; and Levy, Newton, Jr.,3,655,330.

Ley, Anthony John, to Solartron Electronic Group Limited, The. Density measurements. 3,655,956, Cl. 235-151.3

Libby, Richard L.; Moseley, Robin C.; Jehl, Thomas G.; Ruggirello, William A.; and Dunn, J. Stewart, to DASA Corporation. Data terminal message compiler and transmission system. 3,656,131, Cl. 340-172.5

Liberman, Richard Allen; and Davis, Steven Jay, to General Datacomm Industries. Closed loop test method and apparatus for duplex data transmission mode. 3,655,915, Cl. 179-2.

Liebergott, Norman: *See—*
Yorston, Frederick H.; and Liebergott, Norman,3,655,505.

Lieberman, Lee M.; and Schumann, Robert T., to Technicon Instruments Corporation. Optical system for use in automatic, simultaneous multielement atomic spectroscopy sample analysis apparatus. 3,655,288, Cl. 356-87.

Liemgruber, Willy; and Weigele, Manfred, to Hoffmann-La Roche Inc. Cyano containing hydrazones and methyl sulfate salts thereof. 3,655,716, Cl. 260-459.

Lilly, Eli, and Company: *See—*
Krumkalns, Eriks V.; and Taylor, Harold M., 3,655,359.
Porter, Herschel D., 3,655,666.
Van Heyningen, Earle M., 3,655,656.

Lin, Kingso C.; and Geering, Emil J., to Hooker Chemical Corporation. Pretreatment of plastic surfaces before the application of an adherent organic coating. 3,655,423, Cl. 117-47.

Lince, William G., to UMC Electronics Company. Control system for room reservation. 3,656,113, Cl. 340-153.

Lincoln, Thomas C.; and Voge, Andrew, to Becton, Dickinson Electronics Company. Thumbwheel switch structure with improved U-shaped fasteners for multiple gauged switch housing assembly. 3,655,925, Cl. 200-11.

Linda, Frank R.: *See—*
Leiter, Leigh D.; and Linda, Frank R.,3,655,860.

Linde Aktiengesellschaft Zentrale Patentabteilung: *See—*
Linde, Hermann, 3,654,769.

Linde, Hermann, to Linde Aktiengesellschaft Zentrale Patentabteilung. Process and apparatus for the separation of a hydrogen-containing gaseous mixture. 3,654,769, Cl. 62-23.

Linderman, Duane L.: *See—*
Medawar, George E.; Linderman, Duane L.; and Brannon, Ralph O.,3,655,133.

Lindner, Ernst: *See—*
Groebel, Alfred; and Lindner, Ernst,3,655,886.

Lindquist, Claude Alan, Jr.: *See—*
Hoffman, Mark; and Lindquist, Claude Alan, Jr.,3,655,263.

Lindquist, Robert H., to Chevron Research Company. Metals and metal alloys and preparation thereof. 3,655,360, Cl. 75-0.5

Lindros, Charles J.: *See—*
Ditonto, Alexander N.; and Lindros, Charles J.,3,655,125.

Ling, Wei Tsing. Carding machines. 3,654,667, Cl. 19-112.

Link, Helmut, to Index-Werke K.G., Hahn & Tessky. Speed change transmission. 3,654,819, Cl. 74-360.

Linn, William Joseph; and Stiles, Alvin Barber, to Du Pont de Nemours, E. I., and Company. Process of dimerizing acrylonitrile. 3,655,724, Cl. 260-465.8

Lithoplate, Inc.: *See—*
Thomas, Daniel C., 3,655,625.

Litt, Morton H.: *See—*
Anello, Louis G.; Sweeney, Richard F.; and Litt, Morton H.,3,655,677.

Littelfuse, Inc.: *See—*
Reed, James M., 3,654,824.

Litton Systems, Inc.: *See—*
Lehrer, Alexander, 3,654,869.
Mee, Thomas Francis; and Mee, Thomas Francis, 3,656,162.
Mee, Thomas Francis; and Mee, Thomas Francis, 3,656,162.

Livington, William L., to Factory Mutual Research Corporation. Pressure responsive fluid nozzle. 3,655,136, Cl. 239-452.

Lockheed Aircraft Corporation: *See—*
Lyons, Ernest H., Jr., 3,655,547.
Peterson, Carlton G., 3,654,811.
Rempt, Henry F.; and Rempt, Henry F., 3,656,164.
Williams, William W., 3,655,149.

Lockwood, William H., Jr.: *See—*
Rakow, Marvin S.; and Lockwood, William H., Jr.,3,655,807.

Loeffler, Louis H. Peeling device. 3,654,976, Cl. 146-49.

Lofquist, Robert A.; and Hayes, Brendan T., deceased0 (by Hayes, Barbara E.; administratrix), to Allied Chemical Corporation. Polyamide filaments containing antistatic poly- ether prepared from a polyalkylene and an aliphatic dicarboxylic acid. 3,655,821, Cl. 260-857.

Loftus, Joseph F.: *See—*
Cavagnero, Erman V.; and Loftus, Joseph F.,3,654,693.

Loge, Hans, to Kaltenbach & Voigt. Surgical drill. 3,654,911, Cl. 128-305.

Lohmann, Karl Heinz, to Toms River Chemical Corporation. Metal complex disperse formazane dyes for polyamide. 3,655,637, Cl. 260-149.

Lohse, Friedrich; Schmid, Rolf; Fisch, Willy; and Batzer, Hans, to Ciba Limited. Adducts, containing epoxide groups, from polyepoxide compounds and acid, slightly branched polyester dicarboxylic acids. 3,655,817, Cl. 260-835.

Long, Fred E., to General Tire & Rubber Company, The. Method of forming patterns on substrate surfaces. 3,655,421, Cl. 117-45.

Long, Richard P.: *See—*
Healy, Kent A.; and Long, Richard P.,3,654,765.

Longo, Frank N.; and Patel, Mahesh S., to Metco, Inc. Ceramic clad flame spray powder. 3,655,425, Cl. 117-100.

Longo, Hans-Eberhard; Keller, Wolfgang; and Vogel, Carl-Heinz, to Siemens Aktiengesellschaft. Method of growing rod-shaped dislocation-free monocrystals, particularly of silicon, by crucible-free floating zone melting. 3,655,345, Cl. 23-301.

Longo, Joseph F., to International Dynetics Corporation. Trash compaction unit. 3,654,855, Cl. 100-229.

Lonza Ltd., Gampel (Valais): *See—*
Arni, Urs; Faucci, Adriano; and Stocker, August, 3,655,721.

Loos, Herbert; and Kretzschmar, Karl, to Hurth, Carl, Maschinen und Zahnradfabrik. Toothed tool and device for chipless generation of gears. 3,654,791, Cl. 72-88.

Lorcher, Harry; and Spreitzer, Franz, to Fichtel & Sachs AG. Shock absorber assembly and method of making the same. 3,655,017, Cl. 188-321.

Lord, Ralph Frank. Portable cement mixer. 3,655,168, Cl. 259-177.

Lorenz, Hans Joachim; and Sander, Hans-Jurgen, to Deutsche Advance Produktion GmbH. Phosphorous acid-diesters and epoxy resin systems containing the same. 3,655,816, Cl. 260-830.

Louzos, Demetrios V.; and Mellors, Geoffrey W., to Union Carbide Corporation. Cathode material for solid state batteries. 3,655,453, Cl. 136-121.

Lovelace, Joseph B.: *See—*
Nalley, Charles E.; and Lovelace, Joseph B.,3,655,353.

Lovens Kemiske Fabrik Produktionsaktieselskab: *See—*
Godtfredsen, Wagn Ole, 3,655,658.

Lovgren, Peter: *See—*
Zaki, Wahib Nassif; Coulomb, Jean Marie Louis; and Lovgren, Peter,3,655,568.

Lowe, Lyall. Car top camping shelter. 3,655,077, Cl. 224-42.1

Lubrizol Corporation, The: *See—*
Allen, John Wight, 3,655,556.

Lucas, Howard Robert, to American Cyanamid Company. Heat stabilization of polyimides formed from tetralin dianhydrides and diprimary diamines. 3,655,606, Cl. 260-32.6

Lucas, Joseph, (Industries) Limited: *See—*
Leighton, Peter Watson, 3,655,933.
Parkes, Eric Bernard, 3,656,155.

Lucas, Robert Armistead; and Blatter, Herbert Morton, to Ciba Corporation. Methods of treatment using 2-acylimino-1,3- diazacycloalkanes. 3,655,895, Cl. 424-251.

Lucas, Robert Armistead: *See—*
Krug, Hans-Dietrich; Lucas, Robert Armistead; Blatter, Herbert Morton; Lucas, Robert Armistead; and Blatter, Herbert Morton,3,655,840.

Lucca, Salvatore: *See—*
Merker, Reuven; and Lucca, Salvatore,3,655,532.

Lucchesi, Oreste J., to Nuclear-Chicago Corporation. Analog window apparatus for signalling whether a data point represented by a pair of coordinate signals is within a selectably shaped region of two -dimensional space. 3,655,974, Cl. 250-71.5

Luciano, Robert A.: *See—*
Rigney, William R.; Luciano, Robert A.; and Tump, Dirk,3,654,890.

Ludwig, David R.; and Sherman, David A., to Kreske, Walter J. Coaxial assembly for mounting a vasector diode. 3,656,072, Cl. 333-97.

Luisada, August G., to Gentex Corporation. Lightweight knockdown container. 3,655,087, Cl. 220-1.5

Luo, Zong-Shyong: *See—*
Berry, Jack; and Luo, Zong-Shyong,3,654,816.

Luscombe, Gene A. Machine for comminuting glassware and the like. 3,655,138, Cl. 241-99.

Lussier, Maurice G. Double chambered container. 3,655,037, Cl. 206-63.

Lynch, Thomas; and Shah, Dineshchandra S., to Xerox Corporation. Vibratory bowl-toner dispenser. 3,655,033, Cl. 198-220.

Lyons, Ernest H., Jr., to Lockheed Aircraft Corporation. Electrochemical cell having a bipolar electrode. 3,655,547, Cl. 204-248.

Lyth, William W.: *See—*
Gruber, Thomas J.; and Lyth, William W.,3,656,140.

M. & B. Electric Co., Inc.: *See—*
Blair, Darrell J., 3,656,136.

M & T Chemicals Inc.: *See—*
Wowk, Anatole, 3,655,613.

Maass, Richard L.: *See—*
Erb, Edward R.; and Maass, Richard L.,3,655,312.

MacDonell, Murray, to Meyer, Montague L., Limited. Manufacture of structural members and components. 3,654,741, Cl. 52-720.

Mace, Edouard Maurice Eugene Aime: *See—*
Soviche, Gilles Andre Paul; Bues, Jean Pierre; Pavlin, Cyrille Francois; and Mace, Edouard Maurice Eugene Aime,3,654,945.

Machleidt, Hans: *See—*
Reuter, Wolfgang; Kutter, Eberhard; Sauter, Robert; Machleidt, Hans; and Wildfeuer, Alexander,3,655,685.

Machlin, Lawrence J.: *See—*
Wharton, Ferdinand D.; Johnson, John H.; Fields, Joseph E.; and Machlin, Lawrence J.,3,655,869.

Mac Pherson, William Frederick, to Bell Telephone Laboratories, Incorporated. Maintaining a circularly polarized magnetic field at a moving point. 3,656,161, Cl. 343-100.

Mac Zura, George; and Pearson, Alan, to Aluminum Company of America. Production of low-soda alumina. 3,655,339, Cl. 23-142.

Madison, Norman L.: *See—*
Guilmette, F. Peter; and Madison, Norman L.,3,655,733.

Madrid, Robert William, to Xerox Corporation. Intermittent grit removal process. 3,655,375, Cl. 96-1.4

Madsen, Ditlev P.; and Pikel, John H., to Chemetron Corporation. Continuous rendering process. 3,655,702, Cl. 260-412.6

Maeda, Kenji: *See—*
Umezawa, Hamao; Maeda, Kenji; Takeuchi, Tomio; Nitta, Kazuo; Okami, Yoshiro; and Ogawara, Hiroshi,3,655,877.

Maejima, Kazutaka: *See—*
Isono, Masao; Tomoda, Katsumi; Miyata, Kouichi; Maejima, Kazutaka; and Tsubaki, Keisuke,3,655,570.

Magid, Louis: *See—*
Koff, Arnold; and Magid, Louis,3,655,852.

Magnavox Company, The: *See—*
Richeson, William E., Jr.; and Feher, Mike B., 3,656,151.

Magnetic Forming Corporation: *See—*
Bolen, Hugh R., Jr.; and Wiggins, Charles S., 3,655,297.

Maher, William M., to General Electric Company. Brush holder assembly. 3,656,018, Cl. 310-242.

Maier, John E.: *See—*
Patel, Kalyanji U.; and Maier, John E.,3,655,727.

Maillard, Jacques George, to Laboratories Jacques Logeais. Process for the preparation of oxazolidinone derivatives. 3,655,673, Cl. 260-293.66

Major, Harry. Hot test connector for internal combustion engines. 3,655,225, Cl. 285-311.

Maley, Gerald A.; and Walsh, James L., to International Business Machines Corporation. Ternary read-only memory. 3,656,117, Cl. 340-173.

Malia, Michael W., to Amerace Esna Corporation. Connector construction for high voltage shielded cables. 3,656,084, Cl. 339-60.

Mallanik, Allan: *See—*
De Luca, Carlo Bruno; and Mallanik, Allan,3,656,057.

Mallinckrodt Chemical Works: *See—*
Brown, James L.; Himebaugh, Donald T.; and Montgomery, James R., 3,655,985.
Montgomery, James R.; and Struttman, Lloyd G., 3,655,981.

Mallory, Henry Rogers, to Mallory, P. R., & Co., Inc. Portable battery tester with means to simulate normal operating drain conditions. 3,656,061, Cl. 324-29.500

Mallory, P. R., & Co., Inc.: *See—*
Dey, Arabinda N.; and Sullivan, Bernard P., 3,655,585.
Griffiths, Leonard B.; and Krock, Richard H., 3,655,447.
Mallory, Henry Rogers, 3,656,061.

Malme, Elmer K., to Wire Sales Company. Electric fence charger. 3,655,994, Cl. 307-132.

Malme, Elmer K., to Wire Sales Company. Automatic electric fence charging system. 3,655,995, Cl. 307-132.

Mangold, Dietrich: *See—*
Pommer, Horst; Mueller, Herbert; Mangold, Dietrich; and Overwien, Hermann,3,655,735.

Manizza, Guelfo A., to Continental Can Company, Inc. Carton with web lock. 3,655,115, Cl. 229-31.

Manning, Robert E.: *See—*
Houlihan, William J.; and Manning, Robert E.,3,655,648.

Marathon Oil Company: *See—*
Norton, Charles J.; and Diehl, Byron C., 3,655,736.

Marbury, Benjamin R.; Hestad, Alfred M.; and Reines, Jose, to International Telephone and Telegraph Corporation. Trunk allotter. 3,655,918, Cl. 179-18.

Marchand, Jacques J.: *See—*
Goldstein, Milton; Hair, George R.; Kutzenco, Jack; and Marchand, Jacques J.,3,655,488.

Margulis, Harry; and Miles, William B., to Addressograph-Multigraph Corporation. High speed photoelectrostatic copying machine. 3,655,283, Cl. 355-14.

Marine Systems, Inc.: *See—*
Thatcher, Robert H., 3,655,294.

Markowitz, Isral J. Safety cover cap for an aerosol container. 3,655,100, Cl. 222-182.

Marovich, Frank A.; and Wilson, Ray I., to Beckman Instruments, Inc. Electrochemical cell. 3,655,546, Cl. 204-195.

Marquette Tool and Die Company: *See—*
Freber, Elmer C., 3,654,795.

Marsh, John F.; and Swietlik, Joseph M., to Esso Research and Engineering Company. Detergent additives. 3,655,557, Cl. 252-32.7

Marsh, Lynn W., Jr., to Mohawk Data Sciences Corporation, mesne. Printer having fewer hammer actuating means than hammers. 3,654,857, Cl. 101-93.

Marsh Stencil Machine Company: *See—*
Hill, Forrest G.; and Kelly, Samuel H., 3,654,863.

Marshall, David: *See—*
Greenland, Leonard Sidney; Smith, Charles Philip; and Marshall, David,3,655,134.

Marshall, Joseph C.: *See—*
Belcher, Richmond D.; Duggan, Robert J.; Ellis, George R.; Esslinger, Robert H.; Goodyear, W. Frederick; Marshall, Joseph C.; and Masone, Thomas R.,3,656,148.

Martelee, Ghislain Antoine Jean-Marie. Gripper for handling heavy products and specifically horizontal-axis coils. 3,655,232, Cl. 294-67.

Martin, Afton V.; and Modovan, Michael T., Jr., to AVM Corporation. Voter instruction device. 3,654,709, Cl. 35-13.

Martin, Elmore L., to Du Pont de Nemours, E. I., and Company. Segmented polyurethanes derived from 2,5- diisopropyl-p-xylylene diisocyanate. 3,655,623, Cl. 260-77.5

Martin, Hubert: *See—*
Schmidt, Walther; and Martin, Hubert,3,655,362.

Martin, Joseph F., 25% to said Martin, 25% to Marmanac, Inc., and 50% to Chemfilt Corporation of America, mesne. Tobacco smoke filter. 3,654,934, Cl. 131-267.

Martin, William L.: *See—*
Willhite, Glen Paul; and Martin, William L.,3,654,691.

Martin-Marietta Corporation: *See—*
Larson, Clarence E.; and Dawley, Richard H., 3,655,104.

Martinez-Alvarez, Francisco; Ruiz, Ricardo Garcia; De Porras, Jaime Molinae; Merino Del Rio, Jose Luis; and Bertsch, Walter, to Electro-Quimica de Flix S.A. Process for the manufacture of carbon tetrachloride. 3,655,789, Cl. 260-664.

Marumo, Hitoshi: *See—*
Inagaki, Junpei; and Marumo, Hitoshi,3,656,017.

Maruyama, Yutaka: *See—*
Nakanishi, Michio; Tahara, Tetsuya; Imamura, Hiroshi; and Maruyama, Yutaka,3,655,681.
Nakanishi, Michio; Tahara, Tetsuya; Imamura, Hiroshi; and Maruyama, Yutaka,3,655,682.

Marvin, Ralph Edward: *See—*
Wood, Arthur Eastman; Marvin, Ralph Edward; and Bates, Ralston Everett,3,656,073.

Marx, Gerhard; and Heist, Hans, to Kalle Aktiengesellschaft. Apparatus for developing electrostatic images. 3,654,896, Cl. 118-50.

Mase, Takehisa; Kawaura, Hirosi; Yamaguchi, Terumoto; and Amano, Yosinao, to Nippondenso Kabushiki Kaisha. Spirally wound web pay-out apparatus. 3,655,142, Cl. 242-55.

Masone, Thomas R.: *See—*
Belcher, Richmond D.; Duggan, Robert J.; Ellis, George R.; Esslinger, Robert H.; Goodyear, W. Frederick; Marshall, Joseph C.; and Masone, Thomas R.,3,656,148.

Massa Division, Dynamics Corporation of America: *See—*
Massa, Donald P., 3,656,097.

Massa, Donald P., to Massa Division, Dynamics Corporation of America. Signal processing system for extracting a periodic signal of unknown frequency from a high level background noise. 3,656,097, Cl. 340-5.

Massachusetts Institute of Technology: *See—*
Lax, Benjamin, 3,655,986.
Orowan, Egon, 3,655,424.

Maston, James W.: *See—*
Anhalt, John W.; Maston, James W.; and Selvin, Gerald J.,3,656,091.

Masucci, Eugene Daniel: *See—*
Busick, Richard Cobbold; and Masucci, Eugene Daniel,3,655,921.

Masuda, Kohei: *See—*
Hagino, Seiji; Masuda, Kohei; Hasegawa, Kazumasa; and Hosono, Yasuzi,3,655,486.

Masuda, Nobuchika: *See—*
Furuichi, Masayoshi; Miyakawa, Seiichi; and Masuda, Nobuchika,3,656,021.

Masurat, Thomas: *See—*
Vinson, Leonard J.; and Masurat, Thomas,3,655,416.

Masuzawa, Isao: *See—*
Kawada, Shin-Ichi; Yoichi, Hirokawa; and Masuzawa, Isao,3,656,043.

Materre, Christine: *See—*
Spangler, Ross; and Materre, Christine,3,654,938.

Matsuda, Motonobu: *See—*
Ueda, Hiroshi; and Matsuda, Motonobu,3,654,843.

Matsuda, Saburo: *See—*
Nakamura, Tutomu; Matsuda, Saburo; and Ito, Yoichi,3,655,988.

Matsumoto, Seiji: *See—*
Tamai, Yasuo; Matsumoto, Seiji; and Honjo, Satoru,3,655,419.

Matsushita Electric Industrial Co., Ltd.: *See—*
Yamamoto, Shohei; Watanabe, Jun; Hosoi, Susumu; Kuwazaki, Masahiro; Ota, Akira; Takata, Toshikatsu; and Asaoka, Junichi, 3,655,449.

Mattel, Inc.: *See—*
Beny, Janos; Bosley, Denis V.; and Kennedy, Melvin R., 3,654,728.

Matthews, Clifford N.: *See—*
Birum, Gail H.; and Matthews, Clifford N.,3,655,766.

Mattison, Philip L.; and Swanson, Ronald R., to General Mills, Inc. Process of extracting copper with certain substituted 2-hydroxybenzophenoximes. 3,655,347, Cl. 23-312.

Matzner, Markus: *See—*
McGrath, James E.; and Matzner, Markus,3,655,822.

Maure, Douglas R., to Optical Memory Systems, Inc., mesne. Read only memory. 3,656,120, Cl. 340-173.

Maxwell, Douglas H., to United Aircraft Corporation. Cast nickel-base alloy. 3,655,462, Cl. 148-32.5

Mayer, David P.: *See—*
Richter, Sidney B.; and Mayer, David P.,3,655,731.
Richter, Sidney B.; and Mayer, David P.,3,655,734.

Mayer Flood Systems Inc.: *See—*
Mayer, Harry E., 3,654,942.

Mayer, Georg, to Mayer KG, Maschinenbau, Firma. Adjustable pot holding means for potting and repotting machines. 3,655,064, Cl. 211-78.

Mayer, Georg; and Glaser, Egon, to Sprecher & Schuh AG. Cabinet, particularly for electrical installations. 3,655,254, Cl. 312-257.

Mayer, Harry E., to Mayer Flood Systems Inc. Mechanically located valve and method of using same. 3,654,942, Cl. 137-1.

Mayer KG, Maschinenbau, Firma: *See—*
Mayer, Georg, 3,655,064.

Mayer, Richard Eugene: *See—*
Meneghini, Carlo; Mayer, Richard Eugene; Lazarus, Stanley David; and Rainer, Norman Barry,3,654,679.

Mayfield, Georgia P.: *See—*
Brak, Stephen B.; Steves, Clarence; and Mayfield, Ross M.,3,654,794.

Mayfield, Ross M.: *See—*
Brak, Stephen B.; Steves, Clarence; and Mayfield, Ross M.,3,654,794.

McAdoo, Charlotte M.: *See—*
McAdoo, Harold L., 3,654,703.

McAdoo, Harold L., to McAdoo, Charlotte M. Dental impression tray.

3,654,703, Cl. 32–017

McAllister, George F., Jr., to Ajax Flexible Coupling Co., Inc. Method and apparatus for conveying and separating materials. 3,655,045, Cl. 209-379.

Mc Cartney, Thomas R.: *See—*
Cook, Kenneth L.; and Mc Cartney, Thomas R.,3,654,854.

Mc Carty, Frederick J., to Richardson-Merrell Inc.1,1'-Methylenebis 4-(3-chlorophenyl)piperazine. 3,655,668, Cl. 260-268.

McClung, Clifford F. Fluid pump. 3,655,301, Cl. 417-437.

McCormick & Company, Inc.: *See—*
Karas, Albert J.; and Vey, John E., 3,655,405.

McCullough, Edward E., to Thiokol Chemical Corporation. Control mechanism. 3,655,148, Cl. 244-3.22

McDonald, Joseph L., to Minnesota Minning and Manufacturing Company. Electrically insulating compositions of dielectric polymer, mica flakes and silicone resin. 3,655,565, Cl. 252-63.2

McDonald, Thomas Victor; and Stockley, Kenneth McDonald, to Smith Industries Limited. Two-part electrical coupling. 3,656,090, Cl. 339-186.

McDonnell Douglas Corporation: *See—*
Walker, James V., 3,655,208.

McDougall, Franklin M., to Dema Engineering Co. Liquid pump. 3,655,296, Cl. 417-214.

Mc Farland, Frederick R.; and Diffenderfer, Walter L., to K-D Manufacturing Company. Clamping tool. 3,654,686, Cl. 29-280.

McGeary, George Jerome, to Colgate-Palmolive Company. Container filling. 3,654,743, Cl. 53-88.

McGee, John K., to Giddings & Lewis, Inc. Linear and circular interpolation contouring control using repeated computation. 3,656,124, Cl. 340-172.5

McGrath, James E.; and Matzner, Markus, to Union Carbide Corporation. Thermoplastic polymer alloy. 3,655,822, Cl. 260-857.

McGraw, Carl W., to Eastman Kodak Company. Method of coating dilute aqueous emulsions. 3,655,407, Cl. 96-114.

McHugh, Wilfred Lewis. Casket capsule. 3,654,676, Cl. 27-2.

McIntosh, Harold A.: *See—*
Rattan, William D.; and McIntosh, Harold A.,3,655,163.

McIntosh, Michael D., to Landis Tool Company, mesne. Control system for a machine tool. 3,655,957, Cl. 235-151.11

McKenney, Gordon M., Jr.: *See—*
Hall, Roger L.; McKenney, Gordon M., Jr.; and Wall, Alfred J.,3,655,192.

McKown, Alan G., to Minnesota Mining and Manufacturing Company. Particulate adhesive containing polyepoxides, carboxylated butadiene-acrylonitrile copolymer, and a urea derivative as a curing agent. 3,655,818, Cl. 260-837.

McMahon, Matthew A., to Texaco Inc. Oxidation of N-paraffins. 3,655,769, Cl. 260-597.

McMahon, Stephen J., Jr. Fitted bed covering. 3,654,646, Cl. 5-334.

McMann, Renville H., Jr.: *See—*
Goldberg, Abraham A.; and McMann, Renville H., Jr.,3,655,908.

McManus, Edward C.; and Rogers, Edward F., to Merck & Co., Inc. Anticoccidial compositions. 3,655,888, Cl. 424-229.

McManus, James Edward. Game board. 3,655,200, Cl. 273-148.

McMurry, Everett D.; and McMurry, Everett D., to McMurry Oil Tools, Inc. McMurry Oil Tools, Inc. Gas lift valve Gas lift valve. 3,654,949, Cl. 137-155.000

McMurry Oil Tools, Inc.: *See—*
McMurry, Everett D.; and McMurry, Everett D., 3,654,949.

Mead, Carver A. Integrated circuit character generator. 3,656,146, Cl. 340-324.

Mead Corporation, The: *See—*
Robertson, John A., 3,656,171.
Robertson, John A.; and Robertson, John A., 3,656,174.
Taylor, Richard P., 3,655,530.

Mead, Daniel R., to Briles Manufacturing. Apparatus and method for installing blind fasteners. 3,654,792, Cl. 72-114.

Meadows, Frank William: *See—*
Bradshaw, Arthur; and Meadows, Frank William,3,655,319.

Medawar, George E.; Linderman, Duane L.; and Brannon, Ralph O., to Rohr Corporation. Thrust controlling apparatus. 3,655,133, Cl. 239-265.31

Medica, Joseph J.; Trout, Kenneth G.; and Kyminas, Stanley C., to Celotex Corporation, The. Acrylic resin containing touch-up filler compound. 3,655,594, Cl. 260-17.

Medical Innovations, Inc.: *See—*
Birtwell, William Clifford, 3,654,919.

Mednick, Sol Abraham, to FMC Corporation. Glycidol isolation by azeotropic distillation with a lower boiling entrainer. 3,655,524, Cl. 203-67.

Medtronic Inc.: *See—*
Hagfors, Norman R., 3,654,933.

Mee, Thomas Francis; and Mee, Thomas Francis, to Litton Systems, Inc. Litton Systems, Inc. Diplexer for radio communication Diplexer for radio communication. 3,656,162, Cl. 343-180.

Meeks, Frederick T., to General Electric Company. Hair retaining device. 3,654,937, Cl. 132-40.

Meermans, Ronald A., to Park-Ohio Industries, Inc. Safety mechanism for high voltage cabinets. 3,655,926, Cl. 299-950.

Meharry, James L., to Societe Nationale des Petroles d'Aquitaine. Cutting apparatus for corn detasseling and soybean harvesting. 3,654,751, Cl. 56-56.

Meier, Robert W.: *See—*
Pitchon, Esra; Gottesman, Martin; and Meier, Robert W.,3,655,398.

Meier, Walter; Burkhardt, Max; and Thalmann, Armin, to Concast AG. Apparatus for cooling continuous castings. 3,654,989, Cl. 165-47.

Meiki Seisakusho, Ltd.: *See—*
Kunogi, Mahito, 3,655,313.

Meindl, Hubert; Ackermann, Hans; and Von Kaenel, Fred, to Ciba-Geigy AG. Process for the production of 5-cyano-uracils. 3,655,665, Cl. 260-260.

Meininger, Fritz; and Hunger, Kaus, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Water-soluble monoazo dyestuffs containing a naphthalene diazo component. 3,655,642, Cl. 260-194.

Mellen, Edward J., Jr.; Baker, Edmond M.; and Webb, John M., said Baker and said Webb assor. to said Mellen. Porcupine shell molds and method of making same. 3,654,984, Cl. 164-26.

Mellors, Geoffrey W.: *See—*
Louzos, Demetrios V.; and Mellors, Geoffrey W.,3,655,453.

Mellow, Dale F.: *See—*
Dehm, Henry C.; and Mellow, Dale F.,3,655,836.

Melpar, Inc.: *See—*
Koch, Bradley R., 3,655,962.
Stowe, Richard W., 3,656,019.

Memorex Corporation: *See—*
Higashi, Louis M., 3,655,595.

Mendel, Arthur, to Riker Laboratories, Inc., mesne. N-(2-Dialkl-aminoalkylene)-esters of fluoroalkoxy- substituted aryl carboxylic acids and salts thereof. 3,655,728, Cl. 260-473.

Meneghini, Carlo; Mayer, Richard Eugene; Lazarus, Stanley David; and Rainer, Norman Barry, to Allied Chemical Corporation. Microvoiding with alkali metal hydroxide a heat fused fabric of polyamide with fiber occluded axially aligned polyester microfibers. 3,654,679, Cl. 28-73.

Mennesson, Andre Louis, to Societe Industrielle de Brevets et d'Etudes S.I.B.E. Improvements in or relating to feed devices for internal combustion engines. 3,654,905, Cl. 123-32.

Mennesson, Bernard Rene, to Societe d'Appareils de Controle et d'Equipment des Moleurs S.A.C.E.M. Disc brakes controlled by bowden cables. 3,655,015, Cl. 188-71.7

Mercade, Venancio V., to Engelhard Minerals & Chemicals Corporation. Method for improving the brightness of gray sedimentary kaolin clay. 3,655,038, Cl. 209-5.

Mercer, Joe F. Motorized fishing line. 3,654,723, Cl. 43-26.1

Mercier, Jacques H.: *See—*
Mercier, Jean; and Mercier, Jacques H.,3,654,964.

Mercier, Jean; and Mercier, Jacques H. Pressure vessels. 3,654,964, Cl. 138-30.

Merck & Co., Inc.: *See—*
Balhofer, William A.; and Baldwin, John J., 3,655,894.
Jensen, Norman P.; Shen, Tsung-Ying; and Windholz, Thomas B., 3,655,901.
McManus, Edward C.; and Rogers, Edward F., 3,655,888.
Morgans, David J.; Bavitz, Joseph F.; and Castello, Robert A., 3,655,742.
Shen, Tsung-Ying; Ruyle, William V.; Walford, Gordon L.; and Witzel, Bruce E., 3,655,679.
Shen, Tsung-Ying; and Walford, Gordon L., 3,655,692.
Shen, Tsung-Ying; Witzel, Bruce E.; and Walford, Gordon L., 3,655,693.
Shen, Tsung-Ying; Witzel, Bruce E.; Walford, Gordon L.; and Ruyle, William V., 3,655,697.
Witzel, Bruce E., 3,655,897.

Merck Patent Gesellschaft mit beschrankter Haftung: *See—*
Habermehl, Gerhard; and Haaf, Arthur,.3,655,649.

Merino Del Rio, Jose Luis: *See—*
Martinez-Alvarez, Francisco; Ruiz, Ricardo Garcia; De Porras, Jaime Molinae; Merino Del Rio, Jose Luis; and Bertsch, Walter,3,655,789.

Merker, Reuven; and Lucca, Salvatore, to Metalux Corporation, The. Method for electroplating nickel. 3,655,532, Cl. 204-49.

Merli, Paoli; and Valbusa, Luigi. Azodicarbonamide fog inhibitors. 3,655,391, Cl. 96-109.

Merrill, Stewart H.: *See—*
Contois, Lawrence E.; Merrill, Stewart H.; and Grau, George S.,3,655,378.

Mertens, Wolfgang: *See—*
Herzer, Kurt; and Mertens, Wolfgang,3,655,241.

Messerschmitt-Bolkow-Blohm, G.m.b.H.: *See—*
Haberkorn, Erich J.; and Englaender, Klaus, 3,655,150.

Messrs. Transporttechnik GmbH: *See—*
Weller, Wilhelm, 3,655,013.

Metabowerke KG: *See—*
Stoy, Franz; and Eder, Heinz, 3,654,739.

Metal Improvement Company, Inc.: *See—*
Koenecke, William J.; and Lazar, Joel R., 3,654,786.

Metallgesellschaft AG: *See—*
Dorschner, Oskar; Carduck, Franz Josef; Storkebaum, Christoph; and Rother, Claus, 3,655,862.

Metallgesellschaft Aktiengesellschaft: *See—*
Schmalfeld, Paul; Sommers, Hans; and Janssen, Heinrich, 3,655,518.

Metalux Corporation, The: *See—*

Merker, Reuven; and Lucca, Salvatore, 3,655,532.
Metco, Inc.: *See—*
Longo, Frank N.; and Patel, Mahesh S., 3,655,425.
Metz, Thomas A.: *See—*
Carnevale, Richard J.; Howe, Leland D., Jr.; Metz, Thomas A.; Womack, Karl K.; and Zurla, Frank A.,3,656,123.
Metzger, William J., to Midland-Ross Corporation. Railway car coupler. 3,655,066, Cl. 213-100.
Meyer, Montague L., Limited: *See—*
MacDonell, Murray, 3,654,741.
Midland Silicones Limited: *See—*
Bush, Richard Paul; and Thomas, Bryan, 3,655,711.
Midland-Ross Corporation: *See—*
Floehr, Walter L., 3,654,873.
Metzger, William J., 3,655,066.
Mikhail, Wadie F.: *See—*
Hsiao, Mu-Yue; and Mikhail, Wadie F.,3,656,107.
Mikulin, Tom T.: *See—*
Shachter, Moses; and Mikulin, Tom T.,3,654,820.
Milbaum, Michael. Random selection ball formed of concentric spheres. 3,655,197, Cl. 273-138.
Miles Laboratories, Inc.: *See—*
Christian, Gary Dale, 3,655,526.
Sternberg, Moshe, 3,655,513.
Miles, William B., to Addressograph-Multigraph Corporation. Illumination control for photocopying machine. 3,655,285, Cl. 355-68.
Miles, William B.: *See—*
Margulis, Harry; and Miles, William B.,3,655,283.
Milk Producers, Inc.: *See—*
Noorlander, Daniel O., 3,655,515.
Miller, Donald D.: *See—*
Reinhard, Clyde J.; and Miller, Donald D.,3,656,065.
Miller, Frank L. Process for producing alpha-pinene of low sulfur content from crude sulfate turpentine. 3,655,803, Cl. 260-675.5
Miller, Harold Nelson: *See—*
Ott, Roy John; and Miller, Harold Nelson,3,655,767.
Miller, Harry Francis, Jr. Boiler soot extractor. 3,655,171, Cl. 261-64.
Miller, Richard H.: *See—*
Engel, Elton D.; and Miller, Richard H.,3,655,929.
Millman, Victor, to Rohr Corporation. Sound suppressing apparatus. 3,655,008, Cl. 181-33.
Mine Safety Appliances Company: *See—*
Cotabish, Harry N.; Wise, Layton A.; and Buban, Elmer E., 3,655,346.
Minnesota Mining & Manufacturing Company: *See—*
Kurhajec, George A.; and Neuvar, Erwin W., 3,655,758.
Minnesota Mining and Manufacturing Company: *See—*
Fayling, Richard E., 3,654,853.
Grundman, Roger V., 3,654,777.
McKown, Alan G., 3,655,818.
Patel, Kalyanji U.; and Maier, John E., 3,655,727.
Rathfelder, Siegfried F., 3,655,279.
Seim, William J., 3,656,088.
Shepard, Joseph W.; and Shely, Benjamin L., 3,655,383.
Minnesota Minning and Manufacturing Company: *See—*
McDonald, Joseph L., 3,655,565.
Minolta Camera Kabushiki Kaisha: *See—*
Ueda, Hiroshi; and Matsuda, Motonobu, 3,654,843.
Minox G.m.b.H.: *See—*
Rinn, Jurgen, 3,655,949.
Minton, Clarence W., to Americal Corporation. Yarn cutter for hosiery knitting machines. 3,654,778, Cl. 66-145.00s
Miocque, Marcel Y.: *See—*
Gautier, Jean A.; Miocque, Marcel Y.; Moskowitz, Henri; Blanc-Guenee, Janine L.; Raynaud, Guy M.; and Dorme, Nicole A. M.,3,655,762.
Miranda, Ronald P.: *See—*
Fetzer, Fred; and Miranda, Ronald P.,3,654,664.
Mischler, Terrence W.: *See—*
Kroc, Robert L.; and Mischler, Terrence W.,3,655,889.
Mitchell, Graham George: *See—*
Roach, Ronald John; and Mitchell, Graham George,3,654,955.
Mitchell, Maurice M., Jr.; Fisher, Harold M.; and Tomezsko, Edward S., to Atlantic Richfield Company. Method for carrying out reactions of unsaturated hydrocarbons at low temperatures. 3,655,792, Cl. 260-666.
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Mitchell, Peter W. D.; and Blumenthal, Jack Herbert, to International Flavors & Fragrances, Inc. 7-Methyl-octadienenitriles. 3,655,722, Cl. 260-465.9
Mitchell, Robert F.; and Carlson, Gordon A., to PPG Industries, Inc. Treatment of titanium tetrachloride drier residue. 3,655,344, Cl. 23-299.
Mitchell, William, to Eco Pump Corporation. Mechanical seal for centrifugal pumps. 3,655,295, Cl. 415-113.
Mitnick, Jack J. Machine for cleaning and polishing pool balls. 3,654,655, Cl. 15-21.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Saito, Nagao; Kobayashi, Kazuhiko; and Niwa, Susumu, 3,655,936.
Mitsubishi Petrochemical Company Limited: *See—*
Hagino, Seiji; Masuda, Kohei; Hasegawa, Kazumasa; and Hosono, Yasuzi, 3,655,486.
Mitsubishi Rayon Co., Ltd.: *See—*
Kato, Tetsuji; Izumi, Mikio; Hayashibara, Yuji; and Suenaga, Kazuo, 3,655,824.
Mitsui Shipbuilding and Engineering Co., Ltd.: *See—*
Iwami, Akira, 3,654,887.
Mitsushima, Hirotsugu: *See—*
Tadenuma, Hachiro; Murakami, Torajiro; and Mitsushima, Hirotsugu,3,655,771.
Miwa, Keiji, to Sanyo Electric Works Ltd. Flux for aluminum soldering. 3,655,461, Cl. 148-23.
Miyakawa, Seiichi: *See—*
Furuichi, Masayoshi; Miyakawa, Seiichi; and Masuda, Nobuchika,3,656,021.
Miyake, Akira: *See—*
Nakazawa, Koiti; Shibata, Motoo; Higashide, Eiji; Kanzaki, Toshihiko; Yamamoto, Hiroichi; Miyake, Akira; Ueyanagi, Jisaburo; and Iwasaki, Hidesuke,3,655,879.
Miyata, Kouichi: *See—*
Isono, Masao; Tomoda, Katsumi; Miyata, Kouichi; Maejima, Kazutaka; and Tsubaki, Keisuke,3,655,570.
Miyauchi, Tsuneshige; Hirano, Jiro; Ueki, Atsufumi; Tatsumi, Ryuji; Mukai, Kunihiro; and Yoshikawa, Shogon, to Nippon Selfoc Kabushiki Kaisha, a/k/a Nippon-Selfoc Co., Ltd. Stereoscopic microscope with graded index fiber objective lenses. 3,655,259, Cl. 350-36.
Miyazako, Takushi: *See—*
Yasuda, Yukio; Tsuji, Nobuo; and Miyazako, Takushi,3,655,389.
Mizuma, Katsuhisa, to Koushuha-Netsuren Kabushiki Kaisha. Steel wire cage wire for chemically prestressed concrete pipe. 3,654,968, Cl. 138-176.
Mizuno, Komei: *See—*
Higashide, Eiji; Hasegawa, Toru; Shibata, Motoo; and Mizuno, Komei,3,655,878.
Mo Och Domsjo Aktiebolag: *See—*
Hellsten, Martin; and Emanuelsson, Jan, 3,655,569.
Mobil Oil Corporation: *See—*
Andress, Harry J., Jr., 3,655,560.
Driscoll, Patrick R., 3,655,659.
Driscoll, Patrick R., 3,655,898.
Schick, John W.; and Gemmill, Robert M., Jr., 3,655,561.
Mochizuki, Kazuo: *See—*
Tanaka, Masao; Kagawa, Tsuneo; Mochizuki, Kazuo; and Kohagura, Masahiro,3,655,514.
Moddemeijer, Jan H.; and Zijlstra, Dirk Jogchum, to Hoogovens Delfstoffen N.V. Apparatus for loosening thread protectors from tubular bodies. 3,654,825, Cl. 81-72.
Modern Decorating Company: *See—*
Olsen, Thomas W., 3,654,856.
Modern Industries, Incorporated: *See—*
Schneider, Franklin R., 3,655,991.
Modern Plastic Sales: *See—*
Scoggin, Baxter I., Jr.; Vaughan, Woodrow E.; and Reed, Gerald D., 3,654,754.
Modovan, Michael T., Jr.: *See—*
Martin, Afton V.; and Modovan, Michael T., Jr.,3,654,709.
Mohawk Data Sciences Corporation: *See—*
Marsh, Lynn W., Jr., 3,654,857.
Moleculon Research Corporation: *See—*
Nichols, Larry D., 3,655,201.
Molvar, Henry E., Jr.: *See—*
Hausslein, Robert W.; and Molvar, Henry E., Jr.,3,655,432.
Monaghan, Stephen R.; and Birch, James D., to United States of America, Navy. Variable axial ratio compensator. 3,656,070, Cl. 333-21.
Monk, John Thomas. Straddle carriers. 3,655,081, Cl. 214-394.
Monsanto Chemicals (Australia) Limited: *See—*
Holan, George; and Samuel, Eva Lea, 3,655,688.
Monsanto Company: *See—*
Andersen, Harry M.; Morris, David C.; and Tolbert, Tommy L., 3,655,863.
Birum, Gail H.; and Matthews, Clifford N., 3,655,766.
Fields, Joseph E.; and Johnson, John H., 3,655,509.
Hobbs, Charles F.; and Wilson, James Dennis, 3,655,690.
Johnson, John H.; and Richard, William R., Jr., 3,655,593.
Ray, Louis F., 3,655,357.
Smith, Lowell R.; and Speziale, Angelo John, 3,655,646.
Wharton, Ferdinand D.; Johnson, John H.; Fields, Joseph E.; and Machlin, Lawrence J., 3,655,869.
Wygant, James C.; Anderson, Richard M.; and Prill, Erhard J., 3,655,726.
Monsnato Company: *See—*
Olin, John F., 3,655,755.
Montecatini Edison S.p.A.: *See—*
Ronzoni, Isidoro; Catoni, Mario; and Chini, Pier Lodovico, 3,655,829.
Montgomery, James R.: *See—*
Brown, James L.; Himebaugh, Donald T.; and Montgomery, James R.,3,655,985.
Montgomery, James R.; and Struttman, Lloyd G., to Mallinckrodt Chemical Works. Closed system generation and containerization of radioisotopes for eluting a daurhter radioisotope from a parent

radioisotope. 3,655,981, Cl. 250-106.

Montgomery, Morris M. Method of growing earthworms and plants and producing compost. 3,654,903, Cl. 119-15.

Montgomery, Raymond A. Carving board attachment for platter. 3,654,979, Cl. 146-215.

Montross, Robert C.: *See—*
Ries, Robert G.; and Montross, Robert C.,3,656,038.

Moore Business Forms, Inc.: *See—*
Wakeman, William R., 3,655,222.

Moore, James F., Jr.; and Norgren, Leigh H., said Norgren assor. to Norbro Corporation. Game boards. 3,655,196, Cl. 273-136.

Moore, Robert E., to Sun Oil Company. Dialkylation of haloadamantanes. 3,655,782, Cl. 260-648.

Moore, Robert M.; Lauterbach, Norman H.; and Armstrong, David P., to Kermath Manufacturing Corporation. X-ray examination chair. 3,655,968, Cl. 250-50.

Moran, James G. Bottle cap and cover. 3,655,102, Cl. 222-484.

Morgan, Burton D. Method for forming concrete panels under compression. 3,655,847, Cl. 264-94.

Morgan Construction Company: *See—*
Kinnicutt, Roger, Jr.; and Hill, William J., 3,655,079.

Morgans, David J.; Bavitz, Joseph F.; and Castello, Robert A., to Merck & Co., Inc. Process for producing magnesium probenecid tetrahydrate. 3,655,742, Cl. 260-518.

Mori, Tetsuo: *See—*
Takeshima, Akio; Ueyama, Tadashi; Ohki, Akinori; and Mori, Tetsuo,3,655,470.

Morita, Tadao; and Nagata, Masanori, to Omron Tateisi Electronics Co. System for disposing of invalid cards in a credit card system or the like. 3,655,946, Cl. 235-61.7

Morozowich, Walter; and Sinkula, Anthony A., to Upjohn Company, The. Antibacterial compositions and methods of treating bacterial infections. 3,655,885, Cl. 424-181.

Morris, David C.: *See—*
Andersen, Harry M.; Morris, David C.; and Tolbert, Tommy L.,3,655,863.

Morrison-Knudsen, Company, Inc.: *See—*
Fearon, Joseph G., 3,654,872.

Morschhauser, Roger J.: *See—*
Schoendorfer, George F.; Morschhauser, Roger J.; Gardner, Thomas S.; and Thompson, Donald L.,3,655,539.

Morton, Henry Clifford; and Rasmussen, Thomas J., to Bendix Corporation, The. Resin impregnated fibrous material having low friction. 3,655,603, Cl. 260-29.3

Morton, Howard S. Insulating construction block. 3,654,740, Cl. 52-222.

Moseley, Robin C.: *See—*
Libby, Richard L.: Moseley, Robin C.; Jehl, Thomas G.; Ruggirello, William A.; and Dunn, J. Stewart,3,656,131.

Moskowitz, Henri: *See—*
Gautier, Jean A.; Miocque, Marcel Y.; Moskowitz, Henri; Blanc-Guenee, Janine L.; Raynaud, Guy M.; and Dorme, Nicole A. M.,3,655,762.

Moskowitz, Philip L., (Trustee): *See—*
Zatko, Lester T., 3,654,790.

Moss, Jerome A. Motor operated pole supported motion display. 3,654,716, Cl. 40-33.

Moss, Philip H.; and Cuscurida, Michael, to Jefferson Chemical Company, Inc. Polyurethane foams prepared from starch-based polyether polyols. 3,655,590, Cl. 260-2.5

Mosso, Paul R.; and Faelten, Carl R., to PPG Industries, Inc. Urethane-containing aminic polyols and foams derived therefrom. 3,655,588, Cl. 260-2.5

Motorola, Inc.: *See—*
Kingsbury, Keith M., 3,656,159.

Mott, Murray H.: *See—*
O'Daniel, Stephen A.; Mott, Murray H.; and Jones, Robert W.,3,655,997.

Moyer, Hallard C.: *See—*
Fauber, Eugene M.; and Moyer, Hallard C.,3,655,563.

Moyer, Joseph D., to Grace, W. R., & Co. Process for preparing nitrilotriacetic acid triamide. 3,655,754, Cl. 260-561.

MPM-Materiali Protettivi Milano S.r.L.: *See—*
Stella, Gianfranco, 3,655,612.

Mueller, Guenther, to Ciba Corporation. Process for the manufacture of a granular material containing oily or liquid therapeutically unable furanosides. 3,655,870, Cl. 424-80.

Mueller, Herbert: *See—*
Pommer, Horst; Mueller, Herbert; and Overwien, Hermann,3,655,768.
Pommer, Horst; Mueller, Herbert; Mangold, Dietrich; and Overwien, Hermann,3,655,735.

Mueller, Max B.; Salatiello, Peter P.; and Kaufman, Herman S., to Allied Chemical Corporation. Cold flow resistant homogeneous copolymers of tetrafluoroethylene and hexafluoropropene and process for preparing them. 3,655,611, Cl. 260-41.

Mueller-Tamm, Heinz; and Hofmann, Alfred, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Laminated metal plates. 3,655,504, Cl. 161-165.

Muir, Earl B.: *See—*
Singer, Robert B.; Muir, Earl B.; and Kotzar, Andrew J.,3,654,822.

Mukai, Kunihiro: *See—*
Miyauchi, Tsuneshige; Hirano, Jiro; Ueki, Atsufumi; Tatsumi, Ryuji; Mukai, Kunihiro; and Yoshikawa, Shogon,3,655,259.

Mulaskey, Bernard F.: *See—*
Csicsery, Sigmund M.; and Mulaskey, Bernard F.,3,655,798.

Munch, Otto R.: *See—*
Laakaniemi, Richard N.; Munch, Otto R.; and Sorenson, Paul H.,3,654,944.

Mundil, Rudolf: *See—*
Fries, Ludwig; Mundil, Rudolf; and Wiechers, Herbert,3,655,709.

Murakami, Keisuke, to Sugihara, John Y. Automatic combination windshield wiper-washer. 3,656,042, Cl. 318-444.

Murakami, Torajiro: *See—*
Tadenuma, Hachiro; Murakami, Torajiro; and Mitsushima, Hirotsugu,3,655,771.

Murphy, G. W., Industries, Inc.: *See—*
Jacyno, Anthony; and Botefuhr, Harold R., 3,656,016.

Murphy, Lawrence J., to Colgate-Palmolive Company. Homogeneous water-based aerosol systems. 3,655,865, Cl. 424-45.

Murray, Dudley Charles, to Pains-Wessex Limited. Pyrothechnic devices. 3,654,867, Cl. 102-37.4

Murray, Raymond P. Voltage dependent phase switch. 3,656,007, Cl. 307-262.

Muth, Karl: *See—*
Weber, Helmut; Weyer, Rudi; Aumuller, Walter; Muth, Karl; and Stach, Kurt,3,655,756.

Myers, Charles L., to Phillips Petroleum Company. Dimerization of conjugated dienes. 3,655,793, Cl. 260-666.

Nagata, Masanori: *See—*
Morita, Tadao; and Nagata, Masanori,3,655,946.
Yamamoto, Mititaka; and Nagata, Masanori,3,655,947.

Naglowsky, Michael. Ceiling construction. 3,654,996, Cl. 169-2.

Naito, Shozo: *See—*
Tanaka, Hiroshi; Naito, Shozo; and Shimizu, Tetsuji,3,656,103.

Nakagomi, Yoshiyuki, to Hitachi, Ltd. Gate circuit for electronic musical instruments. 3,656,008, Cl. 307-268.

Nakamura, Tutomu; Matsuda, Saburo; and Ito, Yoichi, to Sharp Kabushiki Kaisha. Negative resistance light emitting switching devices. 3,655,988, Cl. 250-209.

Nakanishi, Michio; Tahara, Tetsuya; Imamura, Hiroshi; and Maruyama, Yutaka, to Yoshitomi Pharmaceutical Industries, Ltd.Certain 2-amino-3,6-bis lower-alkoxy carbonyl 4,5,6,7-tetrahydro [2,3-c] pyridines. 3,655,681, Cl. 260-294.8

Nakanishi, Michio; Tahara, Tetsuya; Imamura, Hiroshi; and Maruyama, Yutaka, to Yoshitomi Pharmaceutical Industries, Ltd.2-Amino-6-lower alkyl or aralkyl-3-cyano- 4,5,6,7-tetrahydro thieno [2,3-c] pyridine. 3,655,682, Cl. 260-294.8

Nakazawa, Koiti; Shibata, Motoo; Higashide, Eiji; Kanzaki, Toshihiko; Yamamoto, Hiroichi; Miyake, Akira; Ueyanagi, Jisaburo; and Iwasaki, Hidesuke, to Takeda Chemical Industries, Ltd. Rufomycin. 3,655,879, Cl. 424-122.

Nalley, Charles E.; and Lovelace, Joseph B., to PPG Industries, Inc. Glass fiber size. 3,655,353, Cl. 65-3.

Naozumi, Hiratsuka: *See—*
Kozu, Haruo; Kimura, Morio; Watanabe, Tadashi; Naozumi, Hiratsuka; and Yoshida, Michio,3,655,596.

Napoli, Louis Sebastian; and Hughes, John Joseph, to RCA Corporation. Semiconductor device with plurality of small area contacts. 3,656,030, Cl. 317-234.

Natali, Paul W.: *See—*
Tedeschi, Robert J.; and Natali, Paul W.,3,655,571.

National Cash Register Company, The: *See—*
Bucklin, Edward P., Jr.; Evans, Pat E.; and Gerlach, Richard K., 3,656,130.
Carlson, Carl O.; Bernstein, Herbert L.; Franco, Albert J.; Carlson, Carl O.; Bernstein, Herbert L.; Franco, Albert J.; Carlson, Carl O.; Bernstein, Herbert L.; and Franco, Albert J., 3,656,175.
Touchman, William S., 3,654,859.
Trzaska, Theodore T., 3,655,019.

National Research Development Corporation: *See—*
Sear, Reginald; and Dean, Peter Mervyn, 3,655,973.
Smith, Dennis Clifford, 3,655,605.
Young, Geoffrey Tyndale, 3,655,636.

Nauta, Wijbe Thomas, to N.V. Koninklijke Pharmaceutische Fabrieken v/h Brocades-Stheeman & Pharmacia. Clyceryl ethers. 3,655,775, Cl. 260-611.

Neathery, John L., Jr., to Nuclear-Chicago Corporation. Frequency to voltage converter with improved temperature stability. 3,656,000, Cl. 307-233.

Nederlandse Organisatie voor Toegepast-Natuurweten- Schappelijk Onderzoek ten Behoeve Van Nijverheid: *See—*
Hirs, Gilles Gerardus, 3,655,248.

Needle Industries Limited: *See—*
Young, George, 3,654,678.

Neff, Ted. Combination wire working tool. 3,654,647, Cl. 7-5.3

Neidig, Klaus: *See—*
Duren, Rainer; and Neidig, Klaus,3,656,098.

Neilson, James McEwan McIntyre, to University of Edinburgh, The. Apparatus for monitoring recurrent waveforms. 3,654,916, Cl. 128-2.06

Nell, Hans Alfred. Method of making a bearing for structural elements. 3,654,684, Cl. 29-149.5

Nelson, Dana W., to Dresser Industries, Inc. Price computer.

3,655,944, Cl. 235-61.

Nelson, L. R., Mfg. Co., Inc.: *See—*
Hayes, Jerry R., 3,655,164.

Nelson, Richard E., to Honeywell Inc. Balanced pressure regulator. 3,654,948, Cl. 137-118.

Nelson, Walter: *See—*
Krass, Morton; and Nelson, Walter,3,655,212.

Neuhardt, Benjamin John, Jr. Mechanical traction. 3,654,921, Cl. 128-75.

Neureiter, Norman P.: *See—*
Schultz, Henry G.; Williams, Herschel C.; Neureiter, Norman P.; and Bown, Delos E.,3,655,718.

Neuvar, Erwin W.: *See—*
Kurhajec, George A.; and Neuvar, Erwin W.,3,655,758.

Newbold, Edward H. Tool holder. 3,654,682, Cl. 29-96.

Newkirk, John B.; Predecki, Paul K.; and Kirsch, Wolff M. Surgical drain for shunting fluid. 3,654,932, Cl. 128-350.

Newman, James W.: *See—*
Gordon, William F.; and Newman, James W.,3,655,140.

Newyear, Edward G.: *See—*
Briody, Robert G.; and Newyear, Edward G.,3,655,706.

Nichols, Larry D., to Moleculon Research Corporation. Pattern forming puzzle and method with pieces rotatable in groups. 3,655,201, Cl. 273-153.

Nickel, Horst; and Suckfull, Fritz, to Farbenfabriken Bayer Aktiengesellschaft. Method of producing aminonaphthalene sulphonic acid. 3,655,740, Cl. 260-509.

Nickl, Josef; Engel, Wolfhard; Eckenfels, Albrecht; Seeger, Ernst; and Engelhardt, Gunther, to Boehringer Ingelheim G.m.b.H. Substituted 4-biphenyl-4-hydroxy crotonic acids and salts thereof. 3,655,743, Cl. 260-247.2

Nielsen, Donald R., to PPG Industries, Inc. Preparation of diperphthalic acids. 3,655,738, Cl. 260-502.

Nienburg, Hans: *See—*
Sturm, Hans Juergen; Armbrust, Herbert; Nienburg, Hans; and Eisfeld, Wolfgang, ,365,574.

Nihon Shokuhin Kako Co., Ltd.: *See—*
Goto, Yasuo; and Taki, Akio, 3,655,396.

Nikles, Erwin, to Ciba Limited. Carbamates and pesticidal preparations containing them. 3,655,730, Cl. 260-479.

Nikles, Francois; and Oguey, Henri T., to Centre Electronique Horloger S. A. Assembly comprising an adjustable capacitor and a printed circuit. 3,656,033, Cl. 317-249.

Nikonov, Vladimir Filippovich: *See—*
Ostrovsky, Grigory Arkadievich; Orlovsky, Anatoly Georgievich; Nikonov, Vladimir Filippovich; Kalner, Veniamin Davydovich; Shklyarov, Isaak Nokhimovich; Stepin, Anatoly Loginovich; Bysink, Alexandr Moiseevich; Shepelyakovsky, Konstantin Zakharovich; and Smirnov, Stanislav Ivanovich,3,655,466.

Niku, Silvio D.: *See—*
Rothrock, Elmer Weyman; and Niku, Silvio D.,3,655,090.

Nilsson, Jan: *See—*
Burstrom, Martin; and Nilsson, Jan,3,654,687.

Nilsson, Marit Gunnel Matilda; Udden, Ruth Gunvor Anna Britt; Udden, Per Edward Carl; and Wennerblom, Bengt Axel, to Svenska Cellulosa Aktiebolaget. Body-fluid absorption article. 3,654,929, Cl. 128-287.

Nippon Electric Company, Limited: *See—*
Akashi, Tsuneo; Sugano, Izuru; Okuda, Taneaki; Onodo, Yoshihiro; and Tsuji, Toshiro, 3,655,841.
Kato, Kotaro, 3,656,150.

Nippon Selfoc Kabushiki Kaisha: *See—*
Miyauchi, Tsuneshige; Hirano, Jiro; Ueki, Atsufumi; Tatsumi, Ryuji; Mukai, Kunihiro; and Yoshikawa, Shogon, 3,655,259.

Nippon-Selfoc Co., Ltd.: *See—*
Miyauchi, Tsuneshige; Hirano, Jiro; Ueki, Atsufumi; Tatsumi, Ryuji; Mukai, Kunihiro; and Yoshikawa, Shogon, 3,655,259.

Nippondenso Kabushiki Kaisha: *See—*
Ito, Mikiji; Yamada, Kenji; and Noda, Kazuo, 3,654,763.
Mase, Takehisa; Kawaura, Hirosi; Yamaguchi, Terumoto; and Amano, Yosinao, 3,655,142.

Nishizawa, Hiroshi: *See—*
Uchida, Shinzi; Nishizawa, Hiroshi; and Sone, Yasuo,3,655,628.

Nitsch, Edward J.: *See—*
Steltzer, Ernest R.; and Nitsch, Edward J.,3,656,105.

Nitta, Kazuo: *See—*
Umezawa, Hamao; Maeda, Kenji; Takeuchi, Tomio; Nitta, Kazuo; Okami, Yoshiro; and Ogawara, Hiroshi,3,655,877.

Niwa, Susumu: *See—*
Saito, Nagao; Kobayashi, Kazuhiko; and Niwa, Susumu,3,655,936.

Noda, Kazuo: *See—*
Ito, Mikiji; Yamada, Kenji; and Noda, Kazuo,3,654,763.

Nogi, Tatsuo: *See—*
Yasuhara, Yutaka; Nogi, Tatsuo; and Takahashi, Ikuzo,3,655,744.

Noorlander, Daniel O., to Milk Producers, Inc. Sample device and method. 3,655,515, Cl. 195-103.5

Norbro Corporation: *See—*
Moore, James F., Jr.; and Norgren, Leigh H., 3,655,196.

Nordqvist, Karl Gustav, to Rederiaktiebolaget Nordstjernan. Radiation sensitive length measuring system. 3,655,990, Cl. 250-219.

Norgren, Leigh H.: *See—*
Moore, James F., Jr.; and Norgren, Leigh H.,3,655,196.

Norsk Hydro Verksteder A/S: *See—*
Aas, Saebjorn; and Brathen, Kare, 3,654,891.

North American Rockwell Corporation: *See—*
Stropki, George T.; and Stropki, George T., 3,656,168.

North, William L., to Forenta, Limited. Steam-air garment press. 3,654,714, Cl. 38-16.

Norton, Charles J.; and Diehl, Byron C., to Marathon Oil Company. Preparation of enol esters from allenes. 3,655,736, Cl. 260-497.

Notomi, Ryota: *See—*
Kanoh, Teruchika; and Notomi, Ryota,3,655,846.

Novak, Richard A. Filtration apparatus. 3,655,058, Cl. 210-360.

Nowell, John R.: *See—*
Genuit, Luther L.; and Nowell, John R.,3,656,052.

Nuclear-Chicago Corporation: *See—*
Lucchesi, Oreste J., 3,655,974.
Neathery, John L., Jr., 3,656,000.

Nutton, James M. Device for connecting and protectively enclosing separated lengths of electrical conductor cable. 3,656,087, Cl. 339-95.

N.V. Bekaert S.A.: *See—*
Wieme, Andre, 3,654,946.

N.V. COQ: *See—*
Houben, Jan P., 3,655,935.

N.V. Koninklijke Pharmaceutische Fabrieken v/h Brocades-Stheeman & Pharmacia: *See—*
Nauta, Wijbe Thomas, 3,655,775.

Nyborg, Ralph Andrew. Aircraft wheel chocks. 3,655,014, Cl. 188-32.

Nye, Alice W. Output commode pan. 3,654,638, Cl. 4-110.

Nykopp, Erik A., to Oy Tampella AB. Press nip of a paper machine composed of a suction roll and a pressure roll. 3,655,507, Cl. 162-358.

Oasis Electronics: *See—*
Hall, Leland V., 3,655,323.

Oberkirch, Wolfgang; Gunther, Peter; and Pampus, Gottfried, to Farbenfabriken Bayer Aktiengesellschaft. Catalyst for the ring opening polymerisation of cyclopentene. 3,655,584, Cl. 252-429.

Oberkobusch, Rudolf: *See—*
Buffleb, Herbert; Franck, Heinz Gerhard; Oberkobusch, Rudolf; Turowski, Johannes; Collin, Gerd; and Zander, Maximilian,3,655,802.

O'Brien, Robert J., to Eastman Kodak Company. Pre-splice film cleaner. 3,655,473, Cl. 156-157.

O'Daniel, Stephen A.; Mott, Murray H.; and Jones, Robert W., to United States of America, Navy. Complementary driver circuit for diode digital phase shifters. 3,655,997, Cl. 307-210.

Oesterein, Fritz: *See—*
Riat, Henri; and Oesterein, Fritz,3,655,639.

Ogawa, Yasuhisa: *See—*
Kumai, Akira; and Ogawa, Yasuhisa,3,655,412.

Ogawara, Hiroshi: *See—*
Umezawa, Hamao; Maeda, Kenji; Takeuchi, Tomio; Nitta, Kazuo; Okami, Yoshiro; and Ogawara, Hiroshi,3,655,877.

Oguey, Henri T.: *See—*
Nikles, Francois; and Oguey, Henri T.,3,656,033.

Ohfuji, Yoshio; and Eguchi, Tamotsu, to Kuraray Co., Ltd. Process for the production of aromatic polybenzimidazoles. 3,655,632, Cl. 260-78.4

Ohio State University, The: *See—*
Walter, Carlton H.; Rudduck, Roger C.; Ryan, Charles E., Jr.; Walter, Carlton H.; Rudduck, Roger C.; Ryan, Charles E., Jr.; Walter, Carlton H.; Rudduck, Roger C.; and Ryan, Charles E., Jr., 3,656,165.

Ohki, Akinori: *See—*
Takeshima, Akio; Ueyama, Tadashi; Ohki, Akinori; and Mori, Tetsuo,3,655,470.

Ohki, Haruo. Motor driven rotatable drum chance device. 3,655,199, Cl. 273-143.

Ohno, Isamu; Kobayashi, Akio; Ohte, Akira; Tamuki, Minoru; and Ohta, Susumu, to Yokogawa Electric Works, Ltd. Electric controller systems with manual and automatic mode. 3,655,992, Cl. 307-87.

Ohta, Susumu: *See—*
Ohno, Isamu; Kobayashi, Akio; Ohte, Akira; Tamuki, Minoru; and Ohta, Susumu,3,655,992.

Ohte, Akira: *See—*
Ohno, Isamu; Kobayashi, Akio; Ohte, Akira; Tamuki, Minoru; and Ohta, Susumu,3,655,992.

Okami, Yoshiro: *See—*
Umezawa, Hamao; Maeda, Kenji; Takeuchi, Tomio; Nitta, Kazuo; Okami, Yoshiro; and Ogawara, Hiroshi,3,655,877.

Okamura Manufacturing Company, Limited: *See—*
Higuchi, Shunichiro; and Katayose, Kazunobu, 3,655,018.

Okuda, Taneaki: *See—*
Akashi, Tsuneo; Sugano, Izuru; Okuda, Taneaki; Onodo, Yoshihiro; and Tsuji, Toshiro,3,655,841.

Okuno, Yositosi: *See—*
Kitamura, Shige Yoshi; Hirai, Hajime; Okuno, Yositosi; and Fujimoto, Keimei,3,655,654.

Olin Corporation: *See—*
Johnson, James T., 3,655,217.

Olin, John F., to Monsnato Company. N-Formyl-α-halo-acetanilides. 3,655,755, Cl. 260-562.

Oliver, Joseph R.: *See—*
Fletcher, Ralph A.; and Oliver, Joseph R.,3,655,243.

Oliver, Rene A.: *See—*
Fauran, Claude P.; Raynaud, Guy M.; Oliver, Rene A.; and Douzon, Colette A.,3,655,687.

Olivetti, Ing., C., & C., S.p.A.: *See—*
Fussel, Rudi, 3,656,173.

Olsen, Alf J., to Teletype Corporation. Cartridge, case and web. 3,655,145, Cl. 242-197.

Olsen, Thomas W., to Modern Decorating Company. Screen printing machine for decorating multi-speed articles. 3,654,856, Cl. 101-40.

Omron Tateisi Electronics Co.: *See—*
Morita, Tadao; and Nagata, Masanori, 3,655,946.
Yamamoto, Mititaka; and Nagata, Masanori, 3,655,947.

Ondrey, John A.; and Swift, Harold E., to Gulf Research & Development Company. Conversion of propylene and isobutene to the corresponding unsaturated aldehydes and acids. 3,655,749, Cl. 260-530.

Ondrey, John A.; and Swift, Harold E., to Gulf Research & Development Company. Method for producing unsaturated aldehydes and acids. 3,655,750, Cl. 260-530.

Onischenko, Grigory Ivanovich: *See—*
Portyanko, Andrei Ivanovich; Lastovenko, Valentin Andreevich; Dudka, Viktor Vasilievich; Rodenko, Fedor Leontievich; Onischenko, Grigory Ivanovich; Vatkin, Adolf Semenovich; Pokusa, Alexei Alexandrovich; and Ruzin, Ivan Mikhailovich,3,654,997.

Onodo, Yoshihiro: *See—*
Akashi, Tsuneo; Sugano, Izuru; Okuda, Taneaki; Onodo, Yoshihiro; and Tsuji, Toshiro,3,655,841.

Optical Memory Systems, Inc.: *See—*
Maure, Douglas R., 3,656,120.

Orbitex, Inc.: *See—*
Siegal, Burton L., 3,655,476.
Stelling, Walter R., Jr.; Siegal, Burton L.; and Talbott, Michael M., 3,655,475.

Organic, Vincent J.: *See—*
Gilson, Russell A.; Kiss, William F.; and Organic, Vincent J.,3,656,002.

Organon, Inc.: *See—*
Price, Richard Thompson; Bauer, Stuart Michael; Brownlee, John; and Goberde, Bastiaan Cornelis, 3,655,838.

Orloff, John F., to Huck Manufacturing Company. Tension stressed structure. 3,655,227, Cl. 287-189.36

Orlovsky, Anatoly Georgievich: *See—*
Ostrovsky, Grigory Arkadievich; Orlovsky, Anatoly Georgievich; Nikonov, Vladimir Filippovich; Kalner, Veniamin Davydovich; Shklyarov, Isaak Nokhimovich; Stepin, Anatoly Loginovich; Bysink, Alexandr Moiseevich; Shepelyakovsky, Konstantin Zakharovich; and Smirnov, Stanislav Ivanovich,3,655,466.

Orowan, Egon, to Massachusetts Institute of Technology. Adhesive tape. 3,655,424, Cl. 117-68.5

Ortho Pharmaceutical Corporation: *See—*
Rigney, William R.; Luciano, Robert A.; and Tump, Dirk, 3,654,890.

Orts, Joseph, to La Telemecanique Electrique. Device for fixing equipment, such as electrical apparatus, on a support. 3,655,154, Cl. 248-27.

Osakada, Atsushi: *See—*
Tamai, Isamu; Oyama, Minoru; Osakada, Atsushi; and Shinohara, Yasuo,3,655,542.

Osbond, John Mervyn; and Philpott, Peter George, to Hoffmann-La Roche Inc. Novel substituted-oxadiazoles and a process for the manufacture thereof. 3,655,684, Cl. 260-307.

Oshima, Teruo: *See—*
Yamamoto, Keisaku; Takao, Hiroyoshi; Hirooka, Masaaki; and Oshima, Teruo,3,655,583.

Osojnak, Boris M., to Engineered Data Products, Inc. Disc pack storage apparatus. 3,654,878, Cl. 108-103.

Ostergren, William F.; and Hurlburt, Joseph C., to Sperry Rand Corporation. Mower mounting linkage. 3,654,749, Cl. 56-15.8

Ostrovsky, Grigory Arkadievich; Orlovsky, Anatoly Georgievich; Nikonov, Vladimir Filippovich; Kalner, Veniamin Davydovich; Shklyarov, Isaak Nokhimovich; Stepin, Anatoly Loginovich; Bysink, Alexandr Moiseevich; Shepelyakovsky, Konstantin Zakharovich; and Smirnov, Stanislav Ivanovich. Universal joint cross of power transmissions and a method of its heat treatment. 3,655,466, Cl. 148-145.

Ota, Akira: *See—*
Yamamoto, Shohei; Watanabe, Jun; Hosoi, Susumu; Kuwazaki, Masahiro; Ota, Akira; Takata, Toshikatsu; and Asaoka, Junichi,3,655,449.

Otis Engineering Corporation: *See—*
Fredd, John V.; and Tamplen, Jack W., 3,654,962.
Sizer, Phillip S., 3,654,995.

Otomo, Yoshiro: *See—*
Kano, Tsuyoshi; Otomo, Yoshiro; and Yamamoto, Hajime,3,655,577.

Ott, Roy John; and Miller, Harold Nelson, to Esso Research and Engineering Company. Flow characteristics of waxy petroleum residuum. 3,655,767, Cl. 260-592.

Ottawa, Norbert; and Schafer, Gustav, to Farbwerke Hoechst Aktiengesellschaft vormals Meister, Lucius & Bruning. Process for the manufacture of basic oxazine dyestuffs. 3,655,601, Cl. 260-242.

Otto, Fritz, to Belder Trust, Reg., mesne. Portable appliances. 3,655,139, Cl. 241-101.

Outcalt, Dale E. Door mounted cervical variable weight traction unit. 3,654,922, Cl. 128-75.

Overman, Joseph De Witt, to Du Pont de Nemours, E. I., and Company. Direct positive emulsions containing amine boranes and bismuth salts. 3,655,390, Cl. 96-108.

Overstreet, Scott M., to Sylvania Electric Products, Inc. Single sensor motor vehicle velocity detector. 3,656,059, Cl. 324-173.

Overwien, Hermann: *See—*
Pommer, Horst; Mueller, Herbert; and Overwien, Hermann,3,655,768.
Pommer, Horst; Mueller, Herbert; Mangold, Dietrich; and Overwien, Hermann,3,655,735.

Ovshinsky, Stanford R., to Energy Conversion Devices, Inc. Printing employing materials with variable volume. 3,654,864, Cl. 101-426.

Owens-Corning Fiberglas Corporation: *See—*
Bastone, Andrew L.; Boeker, Justin R.; and Klimpl, Fred E., 3,655,468.

Owens-Illinois, Inc.: *See—*
Bode, Wolfgang W.; Dunlap, Glenn H.; Kobylak, Anthony M.; Richards, Raymond S.; and Pfaender, Lawrence V., 3,654,680.
Galeano, Sergio F., 3,655,343.

Oy Tampella AB: *See—*
Nykopp, Erik A., 3,655,507.

Oyama, Minoru: *See—*
Tamai, Isamu; Oyama, Minoru; Osakada, Atsushi; and Shinohara, Yasuo,3,655,542.

O.Z. Electrical Manufacturing Company, Inc.: *See—*
Philibert, Robert A.; and Browne, Frank L., 3,655,907.

Pack, Howard S., to Teletype Corporation. Magnetically operable momentary switch assembly. 3,656,181, Cl. 335-205.

Page, Donald E., to Sterling Drug Inc.N,N'-Disubstituted cyclopentane-1,2,3,4- tetracarboximides. 3,655,691, Cl. 260-326.3

Page, Geoffrey A.: *See—*
Krohn, Ivar T.; Page, Geoffrey A.; and Reinis, Gedeminas J.,3,655,372.

Page, Walter; Schevey, William R.; and Vander Mey, John E., to Allied Chemical Corporation. Zinc electroplating process and acidic zinc fluoborate electrolyte therefor. 3,655,533, Cl. 204-55.

Pains-Wessex Limited: *See—*
Murray, Dudley Charles, 3,654,867.

Palermiti, Frank M.; and Chatterji, Arun K., to Xerox Corporation. Imaging process employing novel solid developer material. 3,655,374, Cl. 96-1.4

Palmer, Rufus N.: *See—*
Hall, Harold G.; and Palmer, Rufus N.,3,655,092.

Pampus, Gottfried: *See—*
Oberkirch, Wolfgang; Gunther, Peter; and Pampus, Gottfried,3,655,584.

Panduit Corporation: *See—*
Fulton, Ronald T., 3,654,669.

Pansini, Andrew L. Automatic chlorinator for swimming pools. 3,655,054, Cl. 210-169.

Paramount Packaging Corporation: *See—*
Davis, Francis A., Jr., 3,654,841.

Parish, Clyde E.: *See—*
Anderson, John E.; Parish, Clyde E.; and Ross, George H.,3,655,719.

Park, Kyu C.: *See—*
Ahn, Kie Y.; and Park, Kyu C.,3,656,029.

Park-Ohio Industries, Inc.: *See—*
Meermans, Ronald A., 3,655,926.

Parke, Harry G., to Galbraith-Pilot Marine Corporation. Power conversion system. 3,656,046, Cl. 320-59.

Parker, Earl E.; Christenson, Roger M.; and Dowbenko, Rostyslaw, to PPG Industries, Inc. Novel mixtures of acrylic monomers and polyester resins. 3,655,823, Cl. 260-872.

Parker, Patrick N.: *See—*
Smith, Frank W.; and Parker, Patrick N.,3,654,993.

Parker Pen Company, The: *See—*
Smith, Walter J.; and Rafferty, John W., 3,655,427.

Parkes, Eric Bernard, to Lucas, Joseph, (Industries) Limited. Electromagnetic horns. 3,656,155, Cl. 340-388.

Parliment, Thomas H.; Clinton, William P.; Scarpellino, Richard; Soukup, Robert J.; and Epstein, Martin F., to General Foods Corporation. Flavor compositions and processes. 3,655,397, Cl. 99-65.

Parsons, Timothy F., to Eastman Kodak Company. Diffusion transfer product and process containing 5-seleno-1,2,3,4-tetrazole. 3,655,380, Cl. 96-29.

Passarella, Michael T.: *See—*
Farnam, Robert G.; and Passarella, Michael T.,3,655,210.

Pasternack, Gerald P., to Bell Telephone Laboratories, Incorporated. Time-shared shift register counter with count modified each $n^{th}$ recirculation. 3,656,122, Cl. 340-173.

Patel, Kalyanji U.; and Maier, John E., to Minnesota Mining and Manufacturing Company. Curing system for vinylidine fluoride elastomers. 3,655,727, Cl. 260-470.

Patel, Mahesh S.: *See—*
Longo, Frank N.; and Patel, Mahesh S.,3,655,425.

Patel, Vinayak K., to Cook Electric Company. Method for fusing carbon electrodes and insulating spacers used in electric overvoltage arresters. 3,655,484, Cl. 156-293.

Pater, Richard, to Du Pont de Nemours, E. I., and Company. 2-Aryl-4(3H)-quinazolinones. 3,655,664, Cl. 260-251.

Patrick, Keith H., to Ring Around Products, Inc. Spraying system. 3,655,130, Cl. 239-77.

Paull, Stephen, to Constellation Science and Technology Corporation mesne. Utility meter remote automatic reading system. 3,656,112, Cl. 340-151.

Paulson, Harold E. Printing press feeder. 3,655,181, Cl. 271-29.

Pavlin, Cyrille Francois: *See—*
Soviche, Gilles Andre Paul; Bues, Jean Pierre; Pavlin, Cyrille

Francois; and Mace, Edouard Maurice Eugene Aime,3,654,945.
Pawloski, James A. Powered cutting tool and cutting head therefor. 3,654,700, Cl. 30-247.
Payton, Joy T.: *See—*
Harnsberger, Bobby G.; and Payton, Joy T.,3,654,990.
Harnsberger, Bobby G.; and Payton, Joy T.,3,654,991.
Harnsberger, Bobby G.; and Payton, Joy T.,3,654,992.
Pearson, Alan: *See—*
Mac Zura, George; and Pearson, Alan,3,655,339.
Pechiney-Saint Gobain: *See—*
Raoul, Pierre, 3,655,660.
Pennella, Filippo, to Phillips Petroleum Company. Alkyne conversion. 3,655,804, Cl. 260-678.
Pennwalt Corporation: *See—*
Vidal, Frederick D., 3,655,403.
Pergola, Nicola F. Method and apparatus for treating and disposing of sewage. 3,655,048, Cl. 210-67.
Perozek, David M.: *See—*
Wernikoff, Robert E.; Perozek, David M.; and Roten, Jana M.,3,654,846.
Perrella, Donald J. Educational device. 3,654,706, Cl. 35-9.
Peschcke-Koedt, Andreas D. Merchandising structure. 3,655,061, Cl. 211-57.
Peshkov, Evgeny Viktorovich: *See—*
Artamonova, Nadezhda Ivanovna; Bushin, Leonid Mikhailovich; Besedin, Leonid Nikolaevich; Zhurenko, Anna Timofeevna; Urvantsev, Leonid Mikhailovich; Scherbakov, Jury Dmitrievich; Yasjukevich, Boris Ivanovich; Demin, Anatoly Anisimovich; and Peshkov, Evgeny Viktorovich,3,654,756.
Peter, Joseph E.: *See—*
Inglis, Leslie R.; and Peter, Joseph E.,3,654,768.
Petersen, Jorgen Hartvig, to Danfoss A/S. Rotary seal, particularly for oil pumps. 3,655,205, Cl. 277-87.
Peterson, Carlton G., to Lockheed Aircraft Corporation. Foldable load bearing mechanism and actuating device. 3,654,811, Cl. 74-101.
Peterson, Fred D., to Peterson Products of San Mateo, Inc. Burial urn. 3,654,675, Cl. 27-1.
Peterson, John A., to Hooker Chemical Corporation. Production of phosphates. 3,655,335, Cl. 23-107.
Peterson Products of San Mateo, Inc.: *See—*
Peterson, Fred D., 3,654,675.
Petrie, William E. Tree stand. 3,655,156, Cl. 248-48.
Petro-Tex Chemical Corporation: *See—*
Croce, Louis J.; Bajars, Laimonis; and Gabliks, Maigonis, 3,655,805.
Pfaender, Lawrence V.: *See—*
Bode, Wolfgang W.; Dunlap, Glenn H.; Kobylak, Anthony M.; Richards, Raymond S.; and Pfaender, Lawrence V.,3,654,680.
Pfizer Inc.: *See—*
Freeze, James T.; and Fikes, Alan L., 3,655,616.
Hoffman, Mark; and Lindquist, Claude Alan, Jr., 3,655,263.
Howes, Harold L., Jr.; and Koch, Richard C., 3,655,891.
Rutner, Herman, 3,655,699.
Sciavolino, Frank C.; Routien, John B.; Tynan, Edward J.; and Celmer, Walter D., 3,655,876.
Philibert, Robert A.; and Browne, Frank L., to O.Z. Electrical Manufacturing Company, Inc. Conduit cable seal. 3,655,907, Cl. 174-77.
Phillips, Albert. Rotary percussion drill having a hydraulically actuated percussion device. 3,654,961, Cl. 137-624.13
Phillips Petroleum Company: *See—*
Childs, William V., 3,655,525.
Childs, William V., 3,655,548.
Johnson, Paul H., 3,655,341.
Myers, Charles L., 3,655,793.
Pennella, Filippo, 3,655,804.
Ruehlen, Forrest N.; and Fox, Homer M., 3,655,535.
Spivy, Paul L., 3,655,856.
Young, Richard K., 3,655,480.
Young, Richard K.; and Dockery, Calvin D., 3,655,848.
Philpott, Peter George: *See—*
Osbond, John Mervyn; and Philpott, Peter George,3,655,684.
Pickett, Theodore C. Binocular viewing device. 3,655,264, Cl. 350-145.000
Pierson, Daniel H. Board game apparatus. 3,655,194, Cl. 273-131.
Pikel, John H.: *See—*
Madsen, Ditlev P.; and Pikel, John H.,3,655,702.
Pilkington Brothers Limited: *See—*
Twist, Douglas, 3,655,233.
Piller, Bernhard, to Ciba Limited. Silver halide material containing a monoazo dyestuff. 3,655,388, Cl. 96-99.
Pillsbury Company, The: *See—*
Easter, Ross A., 3,655,096.
Piper, Douglas E.; Jarvis, James G.; and Smith, Dale L., to Eastman Kodak Company. Automatic bias control for electrostatic development. 3,654,893, Cl. 118-2.
Piper, James R. Heating system. 3,655,127, Cl. 237-8.
Pipes, George R., to Eaton Corporation. Warehouse apparatus with an airbearing supported stacker. 3,655,074, Cl. 214-16.4
Pitchon, Esra; and Earle, Ernest L., Jr., to General Foods Corporation. Instant coffee and process for making same. 3,655,399, Cl. 99-71.
Pitchon, Esra; Gottesman, Martin; and Meier, Robert W., to General Foods Corporation. Process for manufacture of coffee extract. 3,655,398, Cl. 99-71.
Pitman, James Arnold. Reinforcing apparatus. 3,655,237, Cl. 296-28.
Plasewicz, Casimir F.: *See—*
Hayden, John T., Jr.; and Plasewicz, Casimir F.,3,655,460.
Plasser, Franz; and Theurer, Josef. Mobile track maintenance apparatus. 3,654,868, Cl. 104-2.
Plastic Coating Corporation, The: *See—*
Hakanson, Nils L., 3,654,902.
Platz, Stephan: *See—*
Herzhoff, Peter; Gref, Hans; and Platz, Stephan,3,654,899.
Pleasants, William W. Suspended overpass. 3,654,652, Cl. 14-1.
Plechac, Bohuslav, to Statni Vyzkumny Ustav Kozedelny. Apparatus for the continuous extraction of water from flat material. 3,654,781, Cl. 69-41.
Plempel, Manfred: *See—*
Buchel, Karl H.; Regel, Erik; and Plempel, Manfred,3,655,899.
Buchel, Karl H.; Regel, Erik; and Plempel, Manfred,3,655,900.
Plessey Company, The: *See—*
Lea, Charles A.; and Lea, Charles A., 3,656,167.
Pneumatic Systems Inc.: *See—*
Kamena, David H., 3,654,882.
Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes: *See—*
Gramain, Jean Charles Marie, 3,654,965.
Poglein, Leslie J. Automatic scriber. 3,654,704, Cl. 33-18.
Pogonovski, Ivo C.; and Carmichael, Paul D., to Texaco Inc. Liquid storage facility including self-actuating discharge conduit. 3,654,951, Cl. 137-355.16
Pokusa, Alexei Alexandrovich: *See—*
Portyanko, Andrei Ivanovich; Lastovenko, Valentin Andreevich; Dudka, Viktor Vasilievich; Rodenko, Fedor Leontievich; Onischenko, Grigory Ivanovich; Vatkin, Adolf Semenovich; Pokusa, Alexei Alexandrovich; and Ruzin, Ivan Mikhailovich,3,654,997.
Polaroid Corporation: *See—*
Bader, Henry; and Boag, Alexander, 3,655,764.
Buzzell, Harold O., 3,655,494.
Land, Edwin H.; and Land, Edwin H., 3,655,277.
Sharp, John R., 3,654,848.
Polinsky, Samuel M.; and Schellinger, Alfred K., to Kennecott Copper Corporation. Process for desulfation of alkaline solutions. 3,655,337, Cl. 23-122.
Pollington, Bernard M.; and Pollington, Leslie W. Cutting tool. 3,655,969, Cl. 29-96.
Pollington, Leslie W.: *See—*
Pollington, Bernard M.; and Pollington, Leslie W.,3,655,969.
Polyakov, Georgy Filippovich; Vanin, Vladimir Lvovich; and Kamardin, Vladimir Alexandrovich. Metallic sealing member for locking and split devices. 3,655,209, Cl. 277-235.
Polycon Industries, Inc.: *See—*
Stollman, Irving; and Banaitis, Raymond, 3,655,034.
Polytop Corporation: *See—*
Hazard, Robert E., 3,655,099.
Hazard, Robert E., 3,655,103.
Pomeranz, Jehoshua N.: *See—*
Kemerer, Douglas W.; and Pomeranz, Jehoshua N.,3,656,004.
Pommer, Horst; Mueller, Herbert; Mangold, Dietrich; and Overwien, Hermann, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of 3-methylbut-2-en-l-ol or 3- methylbut-2-en-l-yl acetate. 3,655,735, Cl. 260-491.
Pommer, Horst; Mueller, Herbert; and Overwien, Hermann, to Badische Anilin- & Soda-Fabrik AG. Production of alk-1-en-6-ones. 3,655,768, Cl. 260-593.
Poppe, Wassily; Khelghatian, Habet M.; and Fitzpatrick, James E., to Standard Oil Company. Platable polymers. 3,655,433, Cl. 117-138.8
Porter, Herschel D., to Lilly, Eli, and Company. 2,4-Di-(4-arylpiperazino)-3-pentanones for treating schistosomiasis. 3,655,666, Cl. 260-268.
Porter, Lawrence Christie, to Upjohn Company, The. Apparatus for producing isotropic foamed synthetic resin stock. 3,655,311, Cl. 18-5.
Portion-Trol Liquor Systems, Inc.: *See—*
Johnson, Robert J.; and Zipper, Walter J., 3,655,952.
Portyanko, Andrei Ivanovich; Lastovenko, Valentin Andreevich; Dudka, Viktor Vasilievich; Rodenko, Fedor Leontievich; Onischenko, Grigory Ivanovich; Vatkin, Adolf Semenovich; Pokusa, Alexei Alexandrovich; and Ruzin, Ivan Mikhailovich. Root harvester. 3,654,997, Cl. 171-58.
Potman, Hendrik: *See—*
Sempel, Hendrinus; and Potman, Hendrik,3,655,839.
Potter Instrument Company, Inc.: *See—*
Ross, Joseph A.; and Hemdal, Hakan O., 3,656,154.
Potts, John D.: *See—*
Kirsch, Francis W.; Potts, John D.; and Barmby, David S.,3,655,813.
Poulsen, Peder Ulrik. Winding and feeding mandrel for forming tubing from strip material. 3,655,489, Cl. 156-429.
Powerdyne Inc.: *See—*
Frey, Albert M., 3,655,930.
PPG Industries, Inc.: *See—*
Briody, Robert G.; and Newyear, Edward G., 3,655,706.
Gillery, Frank H.; and Pressau, Jean P., 3,655,545.
Mitchell, Robert F.; and Carlson, Gordon A., 3,655,344.
Mosso, Paul R.; and Faelten, Carl R., 3,655,588.
Nalley, Charles E.; and Lovelace, Joseph B., 3,655,353.
Nielsen, Donald R., 3,655,738.
Parker, Earl E.; Christenson, Roger M.; and Dowbenko, Rostyslaw, 3,655,823.

Seiner, Jerome A., 3,655,129.
Seiner, Jerome A., 3,655,591.
Wiley, Daniel E., 3,655,787.

Pratt & Whitney, Inc.: *See—*
Yankee, Herbert L., 3,654,800.

Pratt, Aloysius W., to Kohler Co. Fast response feedback controlled generator. 3,656,051, Cl. 322-28.

Predecki, Paul K.: *See—*
Newkirk, John B.; Predecki, Paul K.; and Kirsch, Wolff M.,3,654,932.

Pressau, Jean P.: *See—*
Gillery, Frank H.; and Pressau, Jean P.,3,655,545.

Preuss, Heinz. Device for reducing the supersonic boom caused by aircraft. 3,655,147, Cl. 244-1.

Preway Inc.: *See—*
Derringer, Ray; and Faehling, Francis L., 3,654,913.

Price, Richard Thompson; Bauer, Stuart Michael; Brownlee, John; and Goberde, Bastiaan Cornelis, to Organon, Inc. Method of pelletizing analytical or immunological reagents. 3,655,838, Cl. 264-13.

Prill, Erhard J.: *See—*
Wygant, James C.; Anderson, Richard M.; and Prill, Erhard J.,3,655,726.

Pringle, William L., to Radke, Lee, Associates, Inc. Remotely controlled day-night mirror. 3,655,273, Cl. 350-281.

Procter & Gamble Company, The: *See—*
Zaki, Wahib Nassif; Coulomb, Jean Marie Louis; and Lovgren, Peter, 3,655,568.

Proctor & Schwartz, Inc.: *See—*
Chung, Seng Fang; Kuechler, William L.; Steinbronn, George J.; Chung, Seng Fang; Kuechler, William L.; Steinbronn, George J.; Chung, Seng Fang; Kuechler, William L.; and Steinbronn, George J., 3,656,177.

Produits Chimiques Pechinery-Saint-Gobain: *See—*
Beau, Raymond; and Fourniquet, Jean, 3,655,580.

Produits Chimiques Pechiney-Saint Gobain: *See—*
Chatelain, Jean, 3,655,592.

Progil: *See—*
Borrel, Philippe; and Lehureau, Jean, 3,655,483.

Prokopec, James C.: *See—*
Douglas, George Albert; and Prokopec, James C.,3,655,027.

Proops, Sydney E., to Quickmaid Rental Service Limited. Vending and recording apparatus. 3,656,145, Cl. 340-310.

Pross, Wilhelm: *See—*
Fahlenberg, Paul; and Pross, Wilhelm,3,654,845.

Prouty, Robert E.; Gilman, John E., III; and Smith, James J., to Essex International, Inc. Time delay electromagnetic device. 3,656,076, Cl. 335-240.

Pryor, Frank H. Sawmill. 3,654,971, Cl. 143-52.

Pryor, Frank H. Sawmill. 3,654,972, Cl. 143-52.

Publishers Paper Co.: *See—*
Turner, Frank A., 3,655,144.

Pugsley, Jack H. Game table with centrally disposed apertured barrier. 3,655,187, Cl. 273-30.

Pulp and Paper Research Institute of Canada: *See—*
Yorston, Frederick H.; and Liebergott, Norman, 3,655,505.

Pulsotronic Merten KG: *See—*
Kind, Guntram; Schroder, Karl-Heinz; and Busse, Rido, 3,655,039.

Purex Corporation, Ltd.: *See—*
Robinson, Ronald A.; and Briggs, Benjamin R., 3,655,566.

Puskas, Elek, to Snyder, Steve Enterprises, Inc. Tape pick-up head demagnetizer. 3,655,924, Cl. 179-100.2

Qualitrol Corporation: *See—*
Domenico, Italo Di, 3,656,078.

Quandt, Herbert C., to Union Carbide Corporation. Graphite crucibles for use in producing high quality quartz. 3,655,354, Cl. 65-24.

Quase, Harold Gerson, to Underwater Storage, Inc. Underwater storage system. 3,655,051, Cl. 210-88.

Quickmaid Rental Service Limited: *See—*
Proops, Sydney E., 3,656,145.

Quinn, Edward J., to Hooker Chemical Corporation. Metalizing substrates. 3,655,531, Cl. 204-30.

Radke, Lee, Associates, Inc.: *See—*
Pringle, William L., 3,655,273.

Raffaelli, Milo L., Sr.: *See—*
Scholl, Carl W.; and Raffaelli, Milo L., Sr.,3,655,477.

Rafferty, John W.: *See—*
Smith, Walter J.; and Rafferty, John W.,3,655,427.

Raffinerie Tirlemontoise: *See—*
Jacques, Pierre, 3,655,645.

Rain Bird Sprinkler Mfg., Corporation: *See—*
Kane, Neil G., 3,654,817.

Rainer, Norman Barry: *See—*
Meneghini, Carlo; Mayer, Richard Eugene; Lazarus, Stanley David; and Rainer, Norman Barry,3,654,679.

Rairden, John R., III, to General Electric Company. Refractory metal/refractory metal nitride resistor films. 3,655,544, Cl. 204-192.

Rajchman, Jan Aleksander; and Kosonocky, Walter Frank, to RCA Corporation. Electrically and optically accessible memory. 3,656,121, Cl. 340-173.

Rajon, Andre, to Societe Rhodiaceta. Acetylation of textile articles of cellulose. 3,655,326, Cl. 8-121.

Rakow, Marvin S.; and Lockwood, William H., Jr., to Cities Service Oil Company. Dodecylbenzenesulfonic acid addition in sulfuric acid alkylation. 3,655,807, Cl. 260-683.63

Ramostar Corporation: *See—*
Re Baratelli, Giuseppe, 3,654,631.

Randall, David I.: *See—*
Chang, Charles H.; and Randall, David I.,3,655,772.

Rank Organisation Limited, The: *See—*
Elliot, Ian R., 3,655,352.

Raoul, Pierre, to Pechiney-Saint Gobain. Process for preparing phthalazone. 3,655,660, Cl. 260-250.

Rasmussen, Thomas J.: *See—*
Morton, Henry Clifford; and Rasmussen, Thomas J.,3,655,603.

Rathfelder, Siegfried F., to Minnesota Mining and Manufacturing Company. Microfiche supporting and positioning apparatus. 3,655,279, Cl. 353-27.

Rattan, William D.; and McIntosh, Harold A., to Robertshaw Controls Company. Anti-hunting diaphragm valve. 3,655,163, Cl. 251-45.

Ratto, Peter Angelo: *See—*
Granatek, Alphonse Peter; Granatek, Edmund Stanley; and Ratto, Peter Angelo,3,655,883.

Ratz, George A.: *See—*
Brickner, Kenneth G.; and Ratz, George A.,3,655,459.

Ratz, Walter, to Bergwerksverband G.m.b.H. Conveyor band monitoring arrangement. 3,656,137, Cl. 340-259.

Rausch, Emerson George: *See—*
Flock, Howard George, Jr.; and Rausch, Emerson George,3,655,552.

Ray, Derek Barrie: *See—*
Ross, Donald Nixon; and Ray, Derek Barrie,3,655,306.

Ray, Jimmy C. Method and means for keeping cables dry. 3,655,905, Cl. 174-11.

Ray, Louis F., to Monsanto Company. Boron phosphate as boron source for plant life. 3,655,357, Cl. 71-1.

Raymond International, Inc.: *See—*
Cavin, Lewis Fred, 3,654,767.

Raymond, Lee Organization, Inc., The: *See—*
Hair, Betty J., 3,655,236.

Raynaud, Guy M.: *See—*
Fauran, Claude P.; Raynaud, Guy M.; Oliver, Rene A.; and Douzon, Colette A.,3,655,687.
Gautier, Jean A.; Miocque, Marcel Y.; Moskowitz, Henri; Blanc-Guenee, Janine L.; Raynaud, Guy M.; and Dorme, Nicole A. M.,3,655,762.

RCA Corporation: *See—*
Bruce, Ross William, Jr., 3,655,912.
Digilio, Frank Anthony, 3,655,126.
Heilmeier, George H., 3,655,269.
Napoli, Louis Sebastian; and Hughes, John Joseph, 3,656,030.
Rajchman, Jan Aleksander; and Kosonocky, Walter Frank, 3,656,121.
Weinberg, Zeev Abraham, 3,656,011.
Wlasuk, Steven, 3,656,062.
Woodward, Oakley McDonald, 3,656,071.

Re Baratelli, Giuseppe, to Ramostar Corporation. Glare shielding device. 3,654,631, Cl. 2-14.

Realty & Industrial Corporation: *See—*
Gubelmann, William S., 3,655,953.

Recovery Systems Research, Inc.: *See—*
Ferguson, Otis B., 3,655,151.

Rederiaktiebolaget Nordstjernan: *See—*
Nordqvist, Karl Gustav, 3,655,990.

Reed, Gerald D.: *See—*
Scoggin, Baxter I., Jr.; Vaughan, Woodrow E.; and Reed, Gerald D.,3,654,754.

Reed, James M., to Littelfuse, Inc. Fuse extractor unit. 3,654,824, Cl. 81-3.8

Reed Paper Group Limited: *See—*
Smith, Michael John; and Lane, William Charles, 3,654,745.

Reed, William A.; Kinzer, William K.; Swanson, John J.; and Kusner, Robert E., to Republic Steel Corporation. Process for producing metal powder. 3,655,837, Cl. 264-6.

Reeves, Wilson A.: *See—*
Ellzey, Samuel E., Jr.; Connick, William J., Jr.; Reeves, Wilson A.; and Drake, George L., Jr.,3,655,413.

Regel, Erik: *See—*
Buchel, Karl H.; Regel, Erik; and Plempel, Manfred,3,655,899.
Buchel, Karl H.; Regel, Erik; and Plempel, Manfred,3,655,900.

Regie Nationale des Usines Renault: *See—*
Goetz, Bernard, 3,654,692.

Reich, Friedrich: *See—*
Becker, Gustav; Griepentrog, Heinz; Klebert, Wolfgang; and Reich, Friedrich,3,655,437.

Reichhold Chemicals, Inc.: *See—*
Shelton, Frederic J., 3,655,779.

Reichman, Steven H., to Federal-Mogul Corporation. Process for making nickel-based superalloys. 3,655,458, Cl. 148-11.5

Reid, Gilbert R., to Sperry Rand Corporation. Memory plan 3,656,127, Cl. 340-174.

Reifschneider, Walter, to Dow Chemical Company, The. Method for making thioethers. 3,655,773, Cl. 260-609.

Reimer, George M.; and Klose, Frederick M., to Union Special Machine Company. Thread control mechanism for sewing machines. 3,654,883, Cl. 112-245.

Reines, Jose: *See—*
Marbury, Benjamin R.; Hestad, Alfred M.; and Reines,

Jose,3,655,918.

Reinhard, Clyde J.; and Miller, Donald D., to Beckman Instruments, Inc. Bio-potential isolated amplifier. 3,656,065, Cl. 330-10.

Reinis, Gedeminas J.: *See—*
Krohn, Ivar T.; Page, Geoffrey A.; and Reinis, Gedeminas J.,3,655,372.

Rembaum, Alan, to California Institute of Technology. Viscoelastic cationic polymers containing the urethane linkage. 3,655,814, Cl. 260-77.5

Remick, Cassius D., to Electrohome Limited. Electrical precipitator. 3,654,747, Cl. 55-126.

Rempt, Henry F.; and Rempt, Henry F., to Lockheed Aircraft Corporation Lockheed Aircraft Corporation. Retractable aircraft antenna with streamlined radome for scanning Retractable aircraft antenna with streamlined radome for scanning Retractable aircraft antenna with streamlined radome for scanning. 3,656,164, Cl. 343-705.

Renken, Howard C.; and Zegers, Theodoor W., to Texas Gulf Sulphur Company. Process for electrowinning zinc from sulfide concentrates. 3,655,538, Cl. 204-114.

Republic Steel Corporation: *See—*
Reed, William A.; Kinzer, William K.; Swanson, John J.; and Kusner, Robert E., 3,655,837.

Research Corporation: *See—*
DeMaine, Paul A. D.; and Springer, Gordon K., 3,656,178.
Healy, Kent A.; and Long, Richard P., 3,654,765.

Research Frontiers, Inc.: *See—*
Forlini, Matthew, 3,655,267.

Restyanszki, Erno. Portable bidet. 3,654,636, Cl. 4-7.

Rettew, Richard Raymond; Wirth, David Griffith, Jr.; and Levy, Newton, Jr., to Grace, W. R., & Co. Process for the preparation of alumina and magnesium aluminate bodies. 3,655,330, Cl. 23-52.

Reuter, Wolfgang; Kutter, Eberhard; Sauter, Robert; Machleidt, Hans; and Wildfeuer, Alexander, to Boehringer Ingelheim G.m.b.H. 2-(Imidazolid inylidence-(2)-amino)-5-nitro- thiazoles and salts thereof. 3,655,685, Cl. 260-306.8

Rexford, Donald L., to General Electric Company. Vortex fluid amplifier circuit for controlling flow of electrically conductive fluid. 3,654,943, Cl. 137-9.

Reynal, Thomas J., to Systronics Incorporated. Information format converter-oscillator. 3,656,066, Cl. 331-65.

Reynolds Metals Company: *See—*
Schmidt, Walther; and Martin, Hubert, 3,655,362.

Reynolds, R. J., Tobacco Company: *See—*
Leffingwell, John Charles, 3,655,720.

Reynolds, Richard S., to Sylvania Electric Products, Inc. Laser beam attenuator. 3,655,268, Cl. 350-152.

Rhone-Poulenc S.A.: *See—*
Bazouin, Andre; and Lefort, Marcel, 3,655,710.
Julia, Marc, 3,655,620.
Werner, Georges, 3,655,871.

Riat, Henri; and Oesterein, Fritz, to Ciba-Geigy AG. Monoazo dyestuffs containing an alkoxy triazine. 3,655,639, Cl. 269-153.

Riat, Henri: *See—*
Seitz, Karl; Klahre, Guenter; and Riat, Henri,3,655,662.

Rich, Leonard G., to Gerber Scientific Instrument Company, The. Damping apparatus for a linear step motor having two translational degrees of freedom. 3,656,014, Cl. 310-913.

Richard, William R., Jr.: *See—*
Johnson, John H.; and Richard, William R., Jr.,3,655,593.

Richards, Raymond S.: *See—*
Bode, Wolfgang W.; Dunlap, Glenn H.; Kobylak, Anthony M.; Richards, Raymond S.; and Pfaender, Lawrence V.,3,654,680.

Richardson, James D., to Amoco Production Company. System for retrieving anchor chains. 3,654,649, Cl. 9-9.

Richardson-Merrell Inc.: *See—*
Mc Carty, Frederick J., 3,655,668.

Richeson, William E., Jr.; and Feher, Mike B., to Magnavox Company, The. Digital function generation network. 3,656,151, Cl. 340-347.

Richman, Peter, to Teradyne Applied Systems, Inc. Oscilloscope reader and calibration system. 3,656,053, Cl. 324-20.

Richmond, Moscow K. Sprocket. 3,654,814, Cl. 74-243.

Richter, Sidney B.; and Mayer, David P., to Velsicol Chemical Corporation. Dialkylamino-benzhydryl dicarboxylates. 3,655,731, Cl. 260-485.

Richter, Sidney B.; and Mayer, David P., to Velsicol Chemical Corporation. Benzhydrylalkanoates. 3,655,734, Cl. 260-487.

Richter, Sidney B.: *See—*
Krenzer, John; and Richter, Sidney B.,3,655,751.

Richterkessing, Frank H., to Cissell, W. M., Manufacturing Company, The. Assembly of fluid spraying guns. 3,655,131, Cl. 239-124.

Rick, Lawrence B. Traveling cylinder printer with tilting carriage retained in a slot in the base. 3,654,858, Cl. 101-269.

Rickard, Robert S.; and Whitfill, Donald L., to Continental Oil Company. Stabilized liquid fertilizer composition. 3,655,358, Cl. 71-34.

Rideout, Arthur J., to International Business Machines Corporation. Integrated lateral transistor having increased beta and bandwidth. 3,656,034, Cl. 317-235.

Ries, Robert G.; and Montross, Robert C., to Square D Company. Field weakening circuit for a series field motor. 3,656,038, Cl. 318-139.

Rietman, Harry J., to Davis, Parke & Company. Mixing vial. 3,654,926, Cl. 128-272.

Rigney, William R.; Luciano, Robert A.; and Tump, Dirk, to Ortho Pharmaceutical Corporation. Tablet dispenser. 3,654,890, Cl. 116-121.

Riker Laboratories, Inc.: *See—*
Mendel, Arthur, 3,655,728.

Rilinger, Alfons, to Roto-Werke GmbH. Sheet-separation device for sheet working machines. 3,655,182, Cl. 271-61.

Rinecker, Franz G., to American Velcro, Inc. Flexible mouth container. 3,655,118, Cl. 229-62.

Rinehart, Verne R., to General Tire & Rubber Company, The. Process for preparing esters of terephthalic acid. 3,655,729, Cl. 260-475.

Ring Around Products, Inc.: *See—*
Patrick, Keith H., 3,655,130.

Rinn, Jurgen, to Minox G.m.b.H. Data processing equipment. 3,655,949, Cl. 235-61.11

Ritzi, Jack, to Chemed Corporation. Method for removing resinous or rubber deposite with organic peroxides. 3,654,940, Cl. 143-2.

Rival Manufacturing Company: *See—*
Cole, John M., 3,654,698.

Roach, Ronald John; and Mitchell, Graham George, to Gramall Industries Proprietary Limited. Kinetic energy cisterns. 3,654,955, Cl. 137-423.

Robb, Robert E., to General Electric Company. Lamp ballast and method of producing same. 3,655,906, Cl. 174-52.

Robbins, Max L.: *See—*
Geyer, Jerome; Hu, Shih-En; and Robbins, Max L.,3,655,558.

Roberto Gonzalez Barrera: *See—*
Rubio, Manuel Jesus, 3,655,385.

Roberts, Arthur H. Method for the manufacture of molded solid plastics articles. 3,655,861, Cl. 264-250.

Roberts, Richard W., to Borg-Warner Corporation. Image positioning means for audiovisual educational apparatus. 3,654,707, Cl. 35-9.00a

Roberts, Robert J. Dynamic spot welder. 3,655,938, Cl. 219-87.

Robertshaw Controls Company: *See—*
Rattan, William D.; and McIntosh, Harold A., 3,655,163.

Robertson, John A., to Mead Corporation, The. Apparatus and method for sorting particles and jet drop recording. 3,656,171, Cl. 346-1.

Robertson, John A.; and Robertson, John A., to Mead Corporation, The Mead Corporation, The. Fluid drop marking apparatus Fluid drop marking apparatus. 3,656,174, Cl. 346-75.

Robertson, John A.: *See—*
Robertson, John A.; and Robertson, John A.,3,656,174.

Robertson, Rodger William: *See—*
Smith, Brian Lawrence; and Robertson, Rodger William,3,655,310.

Robinson, Donald F. Heated die carrier. 3,655,940, Cl. 219-243.

Robinson, Raymond A. System for measuring rotor blade vibration. 3,654,803, Cl. 73-71.4

Robinson, Robert W., to British Steel Corporation, mesne. Radiation sensitive strip width measuring unit and split edge detector. 3,655,989, Cl. 250-219.

Robinson, Ronald A.; and Briggs, Benjamin R., to Purex Corporation, Ltd. Bleach having stable brighteners. 3,655,566, Cl. 252-95.

Rochelt, Gunter. Quick-change picture mount. 3,654,719, Cl. 40-156.

Rodenko, Fedor Leontievich: *See—*
Portyanko, Andrei Ivanovich; Lastovenko, Valentin Andreevich; Dudka, Viktor Vasilievich; Rodenko, Fedor Leontievich; Onischenko, Grigory Ivanovich; Vatkin, Adolf Semenovich; Pokusa, Alexei Alexandrovich; and Ruzin, Ivan Mikhailovich,3,654,997.

Rodgers, Leonard R. Spare wheel carrier for supporting tongue of trailer. 3,655,220, Cl. 280-475.

Roemer, Whitelaw C., to Eastman Kodak Company. Process for the production of integrally formed, random dot photographic images. 3,655,381, Cl. 96-33.

Roeschlein, Eugene R.; Weiss, Donald C.; and Zeph, David L., to United States of America, Navy. Digital delay time compression circuit. 3,656,096, Cl. 340-5.

Rogers, Edward F.: *See—*
McManus, Edward C.; and Rogers, Edward F.,3,655,888.

Rogers, William C.; and Rogers, William C. Antenna tensioning unit Antenna tensioning unit. 3,656,163, Cl. 343-705.

Rohm & Haas Company: *See—*
Dupre, Jean, 3,655,436.
Dupre, Jean; and Booman, Keith A., 3,655,582.
Fellmann, Robert Paul; and Fettes, Robert Clarke, 3,655,826.
Souder, Louis C.; Larsson, Bjorn E.; and Ryan, Charles F., 3,655,825.

Rohr Corporation: *See—*
Hilbig, Jack H., 3,655,007.
Hilbig, Jack H., 3,655,009.
Medawar, George E.; Linderman, Duane L.; and Brannon, Ralph O., 3,655,133.
Millman, Victor, 3,655,008.
Shiflet, Robert H., 3,654,685.

Rohrbacher, James T.; and Wagner, Richard C., to Integral Process Systems, Inc. Pastry coating apparatus. 3,654,894, Cl. 118-17.

Rollins, Eugene C. Carburetor having auxiliary turbine and idle fuel shutoff mechanism. 3,654,909, Cl. 123-144.

Rollins, William H., to Deering Milliken Research Corporation. Fabric process. 3,655,327, Cl. 8-130.1

Romagosa, Ernest L. Self-supporting rotary brush. 3,654,636, Cl. 15-24.

Roman, Leonard F.; and Elliott, George H. Annular electron gun. 3,655,903, Cl. 13-31.

Romney, Russell H. Apparatus and method for producing and transmitting signals. 3,656,157, Cl. 340-404.

Rondestvedt, Christian Scriver, Jr., to Du Pont de Nemours, E. I., and Company. Fluorinated acrylic monomers containing hetero atoms and their polymers. 3,655,732, Cl. 260-486.

Ronzoni, Isidoro; Catoni, Mario; and Chini, Pier Lodovico, to Montecatini Edison S.p.A. Manufactured articles of blends of thermoplastic polymers having different fluidity degrees. 3,655,829, Cl. 260-899.

Roon, Robert J.; and Levenberg, Bruce, to University of Michigan, The Regents of the. Urea assay process and composition. 3,655,516, Cl. 195-103.5

Rosan, Jose, Sr. Apparatus and method for extracting the essence from a food substance by controlled agitation. 3,654,852, Cl. 99-323.

Rosch, Gunter: *See—*
Frischkorn, Hans; Schinzel, Erich; and Rosch, Gunter,3,655,574.

Rosen, Ian K.; and Holmgren, William C., to AGSRAD, Inc., mesne. Bead seater. 3,654,980, Cl. 157-1.1

Rosen, Perry: *See—*
Kierstead, Richard Wightman; and Rosen, Perry,3,655,653.

Rosengrant, Barry L.: *See—*
Deeds, Douglas; and Rosengrant, Barry L.,3,655,253.

Rosic, Richard F., to Leisure Group, Inc., The. Rotary sprinkler. 3,655,132, Cl. 239-206.

Ross, Donald Nixon; and Ray, Derek Barrie. Apparatus for molding heart valves. 3,655,306, Cl. 425-109.

Ross, George H.: *See—*
Anderson, John E.; Parish, Clyde E.; and Ross, George H.,3,655,719.

Ross, Joseph A.; and Hemdal, Hakan O., to Potter Instrument Company, Inc. Apparatus for converting a cyclic analog signal to a digital signal. 3,656,154, Cl. 340-347.

Ross Operating Valve Company: *See—*
Bitonit, Paul A., 3,654,958.

Ross, Stephen T.: *See—*
Kaiser, Carl; and Ross, Stephen T.,3,655,676.

Rossi, Alberto; Walter, Armin; Kessler, Werner; and Iselin, Beat, to Ciba Corporation. Antiinflamatory glucose derivatives. 3,655,884, Cl. 424-180.

Rossmy, Gerd, to Goldschmidt, Th., A.G. Equilibrated organopolysiloxane mixtures with terminal sulfuric acid groups and process for their preparation. 3,655,712, Cl. 260-448.2

Rossmy, Gerd; and Koerner, Gotz, to Goldschmidt, Th., A.G. Fire extinguishing foam concentrate comprising an organic fluorine compound and a solubilizing agent. 3,655,555, Cl. 252-3.

Rossmy, Gerd: *See—*
Fink, Hans-Ferdi; Koerner, Gotz; Rossmy, Gerd; and Schmidt, Gunter,3,655,554.

Roten, Jana M.: *See—*
Wernikoff, Robert E.; Perozek, David M.; and Roten, Jana M.,3,654,846.

Rother, Claus: *See—*
Dorschner, Oskar; Carduck, Franz Josef; Storkebaum, Christoph; and Rother, Claus,3,655,862.

Rothrock, Elmer Weyman; and Niku, Silvio D., to Chicago Bridge & Iron Company. Vessel and closure with interlocking shear ring joint. 3,655,090, Cl. 220-42.

Roto-Werke GmbH: *See—*
Rilinger, Alfons, 3,655,182.

Roush, Allan N.: *See—*
Chao, Tai S.; and Roush, Allan N.,3,655,562.

Routien, John B.: *See—*
Sciavolino, Frank C.; Routien, John B.; Tynan, Edward J.; and Celmer, Walter D.,3,655,876.

Rouverol, William S. Ball-disk drive. 3,654,812, Cl. 74-200.

Roveti, Denes. Current limiter. 3,656,025, Cl. 317-20.

Roy, Rustum: *See—*
Wood, Charles; Schottmiller, John C.; and Roy, Rustum,3,655,376.

Royster, Ronald B., Sr. Computer controlled stolen vehicle detection system. 3,656,111, Cl. 340-149.

Rubio, Manuel Jesus, to Roberto Gonzalez Barrera. Tortilla and process using edible hydrophilic. 3,655,385, Cl. 99-80.

Rudduck, Roger C.: *See—*
Walter, Carlton H.; Rudduck, Roger C.; and Ryan, Charles E., Jr.,3,656,165.

Rudolph, Otfried; and Kuhn, Wilfried, to Veb Druckmaschinenwerk Planeta. Sheet carrier cylinder for use in a poly-chrome rotary printing press adapted for both one-side and two-side printing. 3,654,861, Cl. 101-183.

Ruehlen, Forrest N.; and Fox, Homer M., to Phillips Petroleum Company. Multi-porosity electrode for electrochemical conversion. 3,655,535, Cl. 204-59.

Ruff, Donald O., to General Motors Corporation. Fault indicator circuit for vehicular battery charging systems. 3,656,135, Cl. 340-248.

Ruger, William B., to Sturm, Ruger & Co., Inc. Trigger guard assembly. 3,654,720, Cl. 42-75.

Ruggirello, William A.: *See—*
Libby, Richard L.; Moseley, Robin C.; Jehl, Thomas G.; Ruggirello, William A.; and Dunn, J. Stewart,3,656,131.

Ruhrgas Aktiengesellschaft: *See—*
Schmalfeld, Paul; Sommers, Hans; and Janssen, Heinrich, 3,655,518.

Ruiz, Ricardo Garcia: *See—*
Martinez-Alvarez, Francisco; Ruiz, Ricardo Garcia; De Porras, Jaime Molinae; Merino Del Rio, Jose Luis; and Bertsch, Walter,3,655,789.

Runde, Herbert A.: *See—*
Bevilacqua, Frank; and Runde, Herbert A.,3,656,074.

Runge, Peter Klaus, to Bell Telephone Laboratories, Incorporated. Resonant self-pulsing acousto-optical modulator. 3,656,068, Cl. 331-94.5

Runge, Wallace F.; and Laine, Robert E., to Commercial Solvents Corporation. Crystallization of 2-nitro-2-methyl-1- propanol. 3,655,781, Cl. 260-643.

Rushton, George L., to Cities Service Company. Process for preparing a polymer composition having improved gloss and color. 3,655,828, Cl. 260-880.

Russ, Bobby L.; and Schmidt, Morris M. Motorcycle mounted face shield holder. 3,655,107, Cl. 224-30.

Russell, Arthur G., Company, Incorporated, The: *See—*
Willis, Grant N., 3,655,032.

Russell, Cornelius R.; and Russell, Sid, to United Aircraft Corporation. Process for separating gases. 3,655,537, Cl. 204-60.

Russell, Sid: *See—*
Russell, Cornelius R.; and Russell, Sid,3,655,537.

Rutgerswerke Aktiengesellschaft: *See—*
Buffleb, Herbert; Franck, Heinz Gerhard; Oberkobusch, Rudolf; Turowski, Johannes; Collin, Gerd; and Zander, Maximilian, 3,655,802.

Rutkowski, Karl: *See—*
Gerke, Peter; Rutkowski, Karl; and Bock, Helmuth Joachim,3,655,922.

Rutner, Herman, to Pfizer Inc. Analogues of lapachol as antitumor agents. 3,655,699, Cl. 260-396.

Ruyle, William V.: *See—*
Shen, Tsung-Ying; Ruyle, William V.; Walford, Gordon L.; and Witzel, Bruce E.,3,655,679.
Shen, Tsung-Ying; Witzel, Bruce E.; Walford, Gordon L.; and Ruyle, William V.,3,655,697.

Ruzin, Ivan Mikhailovich: *See—*
Portyanko, Andrei Ivanovich; Lastovenko, Valentin Andreevich; Dudka, Viktor Vasilievich; Rodenko, Fedor Leontievich; Onischenko, Grigory Ivanovich; Vatkin, Adolf Semenovich; Pokusa, Alexei Alexandrovich; and Ruzin, Ivan Mikhailovich,3,654,997.

Ryan, Charles E., Jr.: *See—*
Walter, Carlton H.; Rudduck, Roger C.; and Ryan, Charles E., Jr.,3,656,165.

Ryan, Charles F.: *See—*
Souder, Louis C.; Larsson, Bjorn E.; and Ryan, Charles F.,3,655,825.

Rylander, Paul N.; and Steele, Duane R., to Engelhard Minerals & Chemicals Corporation. Hydrogenation of unsaturated aldehydes to unsaturated alcohols. 3,655,777, Cl. 260-618.

Saam, John C., to Dow Corning Corporation. Method of silylating organic vinylic polymers. 3,655,633, Cl. 260-79.

Sadwith, Howard M. Method and apparatus for sanding roadways. 3,655,093, Cl. 222-1.

Saito, Nagao; Kobayashi, Kazuhiko; and Niwa, Susumu, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for electroerosively etching a workpiece. 3,655,936, Cl. 219-69.

Sajus, Lucien: *See—*
Lassau, Christian; and Sajus, Lucien,3,655,799.

Salatiello, Peter P.: *See—*
Mueller, Max B.; Salatiello, Peter P.; and Kaufman, Herman S.,3,655,611.

Sale-Niagara, Inc.: *See—*
Thompson, Roy G., 3,655,119.

Salim, Ehsan: *See—*
Ullmann, Werner; Tadini, Costantino; and Salim, Ehsan,3,655,937.

Salyer, Ival O.; and Blardinelli, Albert J., to United States of America, Health, Education, and Welfare. Thromboresistant articles containing epoxy resins and polyethyleneoxide-polypropylene oxide block copolymers. 3,655,815, Cl. 260-830.

Samra, Herb G. Advance anti-lockout vehicle parking signal having adjustable deck mounted brackets. 3,656,104, Cl. 340-95.

Samuel, Eva Lea: *See—*
Holan, George; and Samuel, Eva Lea,3,655,688.

Samuelson, Bruce E.; and Dunst, Robert A., to Whirlpool Corporation. Inlet valve and switch for central vacuum cleaner. 3,655,927, Cl. 200-61.6

Sanctuary, Clifford, to Del Mar Engineering Laboratories. Apparatus for automatically measuring and indicating blood pressure. 3,654,915, Cl. 128-2.05

Sander, Hans-Jurgen: *See—*
Lorenz, Hans Joachim; and Sander, Hans-Jurgen,3,655,816.

Sanders Associates, Inc.: *See—*
Babikyan, Jirair A., 3,656,040.
Giles, George R.; and Shuda, Donald G., 3,656,064.

Sanders, James W.: *See—*
Gautraud, Michael G.; and Sanders, James W.,3,655,202.

Sanderson, Thomas F., to Hercules Incorporated. Tall oil rosin of low sulfur content. 3,655,635, Cl. 260-977.

Sando, Yoshikazu; Tsuchihashi, Takashi; and Ishidoshiro, Hiroshi, to Santo Iron Works Co., Ltd. Process for a liquid treatment of cloth. 3,655,328, Cl. 8-149.1

Sandoz AG: *See—*
Bollinger, Pietro; Harri, Eugen; and Sigg, Hans-Peter, 3,655,880.
Sandoz Ltd.: *See—*
Bollinger, Pietro; Harri, Eugen; and Sigg, Hans-Peter, 3,655,880.
Sandoz-Wander, Inc.: *See—*
Coombs, Robert V.; and Galantay, Eugene E., 3,655,652.
Houlihan, William J.; and Manning, Robert E., 3,655,648.
Sankary, Morris: *See—*
Stevens, Stephen S., 3,655,600.
Santo Iron Works Co., Ltd.: *See—*
Sando, Yoshikazu; Tsuchihashi, Takashi; and Ishidoshiro, Hiroshi, 3,655,328.
Sanyo Electric Works Ltd.: *See—*
Miwa, Keiji, 3,655,461.
Saran, Herbert; and Budnowski, Manfred, to Henkel & Cie G.m.b.H. Molding materials based on epoxide compounds. 3,655,624, Cl. 260-77.5
Sato, Masamichi: *See—*
Takimoto, Masaaki; Sato, Masamichi; and Honjo, Satoru,3,655,966.
Saucy, Gabriel: *See—*
Andrews, David; and Saucy, Gabriel,3,655,695.
Sauer, Theo; and Schulz, Gunter, to Agfa-Gevaert Aktiengesellschaft. Process and device for continuous preparation of emulsions. 3,655,166, Cl. 259-27.
Saul, Benno Bensiyon. Security devices. 3,656,001, Cl. 307-235.
Sauter, Robert: *See—*
Reuter, Wolfgang; Kutter, Eberhard; Sauter, Robert; Machleidt, Hans; and Wildfeuer, Alexander,3,655,685.
Savage, Deborah F.: *See—*
Savage, Robert H.,3,655,292.
Savage, Robert H., deceased0 (by Savage, Deborah F.; administratrix), to Art Metal-Knoll Corporation. Guide rod locking and releasing mechanism for file drawers. 3,655,292, Cl. 402-63.
Sawafuji Electric Co., Ltd.: *See—*
Hazumi, Kenji, 3,656,049.
Scandia Packaging Machinery Company: *See—*
Anderson, Andrew W., 3,654,829.
Scarpellino, Richard: *See—*
Parliment, Thomas H.; Clinton, William P.; Scarpellino, Richard; Soukup, Robert J.; and Epstein, Martin F.,3,655,397.
Schacht, Louis L. Removable closure. 3,654,732, Cl. 49-127.
Schade, Johannes: *See—*
Wittmoser, Adalbert; Schade, Johannes; and Krzyzanowski, Erich,3,654,987.
Schafer, Gustav: *See—*
Ottawa, Norbert; and Schafer, Gustav,3,655,601.
Schaller, Frank W.: *See—*
Snape, Edwin; and Schaller, Frank W.,3,655,465.
Scharf, Friedrich: *See—*
Willhaus, Werner; and Scharf, Friedrich,3,655,084.
Schaun, Wolfgang Eugene, to Dentsply International Inc. Dental ceramic firing ovens. 3,655,941, Cl. 219-399.
Schellinger, Alfred K.: *See—*
Polinsky, Samuel M.; and Schellinger, Alfred K.,3,655,337.
Scherb, Helmut: *See—*
Brandt, Hans-Walther; Engelhard, Bruno; Steude, Heinrich; Scherb, Helmut; Schleppinghoff, Bernhard; and Schnuchel, Gunther,3,655,806.
Scherbakov, Jury Dmitrievich: *See—*
Artamonova, Nadezhda Ivanovna; Bushin, Leonid Mikhailovich; Besedin, Leonid Nikolaevich; Zhurenko, Anna Timofeevna; Urvantsev, Leonid Mikhailovich; Scherbakov, Jury Dmitrievich; Yasjukevich, Boris Ivanovich; Demin, Anatoly Anisimovich; and Peshkov, Evgeny Viktorovich,3,654,756.
Scherhag, Bernhard; and Hausweiler, Arnold, to Farbenfabriken Bayer Aktiengesellschaft, and Erdolchemie Gesellschaft mit beschrankter Haftung. Process for purifying liquid hydrocyanic acid by acid addition and subsequent separation. 3,655,519, Cl. 203-6.
Schering AG: *See—*
Imoehl, Wolfgang; and Borner, Peter, 3,655,617.
Schering Aktiengesellschaft: *See—*
Lehmann, Hans-Gunter; Zollner, Georg; and Wiechert, Rudolf, 3,655,643.
Schesso, LeRoy R. Portable safe. 3,654,880, Cl. 109-25.
Schettler, Kurt, to Siemens Aktiengesellschaft. Sealing and lubricating device for piston pump plunger. 3,655,207, Cl. 277-125.
Schevey, William R.: *See—*
Page, Walter; Schevey, William R.; and Vander Mey, John E.,3,655,533.
Schexnayder, Lawrence F., to Caterpillar Tractor Company. Fluid motor control system. 3,654,836, Cl. 91-448.
Schick, John W.; and Gemmill, Robert M., Jr., to Mobil Oil Corporation. Lubricant compositions containing aryl-indano secondary amines. 3,655,561, Cl. 252-51.5
Schildkraut, Sid I.; Yates, Albert L.; and Cohn, Peter J., to Edo Corporation. Bonding method and product. 3,655,482, Cl. 156-276.
Schindler, Herbert; and Winter, Gerhard, to Schon & Cie Gesellschaft mit beschrankter, Firma. Combined heel, forepart and cement-lasting machine. 3,654,651, Cl. 12-12.5
Schinzel, Erich: *See—*
Frischkorn, Hans; Schinzel, Erich; and Rosch, Gunter,3,655,574.
Schleppinghoff, Bernhard: *See—*
Brandt, Hans-Walther; Engelhard, Bruno; Steude, Heinrich; Scherb, Helmut; Schleppinghoff, Bernhard; and Schnuchel, Gunther,3,655,806.
Schliebs, Reinhard, to Farbenfabriken Bayer Aktiengesellschaft. Process for the preparation of dimethylthiophosphite or of organothiophosphonous acid O- monomethyl ester. 3,655,835, Cl. 260-983.
Schlosser, Wolfgang Otto: *See—*
Beccone, John Peter; Kurokawa, Kaneyuki; and Schlosser, Wolfgang Otto,3,656,069.
Schmalfeld, Paul; Sommers, Hans; and Janssen, Heinrich, to Metallgesellschaft Aktiengesellschaft, and Ruhrgas Aktiengesellschaft. Retort system for oil shales and the like. 3,655,518, Cl. 202-108.
Schmeer, Arline Catherine. Clam extract effective against sarcoma 180 and krebs 2 carcinoma in mice. 3,655,875, Cl. 424-106.
Schmerling, Louis, to Universal Oil Products Company. Alkylation process. 3,655,797, Cl. 260-671.
Schmid, Rolf: *See—*
Lohse, Friedrich; Schmid, Rolf; Fisch, Willy; and Batzer, Hans,3,655,817.
Schmidt, Artur: *See—*
Finkenzeller, Johann; and Schmidt, Artur,3,655,967.
Schmidt, Gunter: *See—*
Fink, Hans-Ferdi; Koerner, Gotz; Rossmy, Gerd; and Schmidt, Gunter,3,655,554.
Schmidt, Morris M.: *See—*
Russ, Bobby L.; and Schmidt, Morris M.,3,655,107.
Schmidt, Thomas, to Supfina, Wieck & Hantzen. Precision honing machine. 3,654,737, Cl. 51-66.
Schmidt, Walther; and Martin, Hubert, to Reynolds Metals Company. Process for the thermal reduction of alumina- bearing ores. 3,655,362, Cl. 75-68.
Schneider, Franklin R., to Modern Industries, Incorporated. Power output unit and method for delivering constant frequency, constant voltage AC power. 3,655,991, Cl. 307-10.
Schneider, Hans-Dieter, to Fernseh G.m.b.H. Arrangement for synchronizing television cameras. 3,655,913, Cl. 178-69.5
Schneider, Klaus: *See—*
Schneider, Wolfgang; and Schneider, Klaus,3,655,318.
Schneider, Wolfgang; and Schneider, Klaus. Apparatus for filling and compacting a mix onto a form of making precast elements. 3,655,318, Cl. 425-218.
Schnettler, Richard A.: *See—*
Suh, John T.; and Schnettler, Richard A.,3,655,671.
Schnitzler. Erwin, Dr.: *See—*
Schnitzler, Ulrich, 3,655,098.
Schnitzler, Ulrich, to Schnitzler, Erwin, Dr. Method of and an apparatus for the formation of layers of comminuted materials. 3,655,098, Cl. 222-135.
Schnuchel, Gunther: *See—*
Brandt, Hans-Walther; Engelhard, Bruno; Steude, Heinrich; Scherb, Helmut; Schleppinghoff, Bernhard; and Schnuchel, Gunther,3,655,806.
Schoendorfer, George F.; Morschhauser, Roger J.; Gardner, Thomas S.; and Thompson, Donald L., to Diamond Shamrock Corporation. Soluble chromate purification by electrolysis. 3,655,539, Cl. 204-128.
Schoernig, Ludwig, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Dental preparations. 3,655,867, Cl. 424-52.
Scholl, Carl W.; and Raffaelli, Milo L., Sr., to Scholl Mfg., Co., Inc., The. Method of making heat-sealed articles. 3,655,477, Cl. 156-202.
Scholl Mfg., Co., Inc., The: *See—*
Scholl, Carl W.; and Raffaelli, Milo L., Sr., 3,655,477.
Scholl, Richard: *See—*
Wisseroth, Karl; and Scholl, Richard,3,655,834.
Schon & Cie Gesellschaft mit beschrankter, Firma: *See—*
Schindler, Herbert; and Winter, Gerhard, 3,654,651.
Schotten, Alfons; and Heimbach, Franz, to Hoesch, Eberhard & Sohne. Filter element for upright filter press. 3,655,056, Cl. 210-227.
Schotten, Alfons: *See—*
Van Egdom, Richard; and Schotten, Alfons,3,655,055.
Schottmiller, John C.: *See—*
Wood, Charles; Schottmiller, John C.; and Roy, Rustum,3,655,376.
Schramm, Inc.: *See—*
Hoffman, Bernard A., 3,655,001.
Schreiner, Edmund D.: *See—*
Wiltz, Robert E.; Schreiner, Edmund D.; and Winsor, Malcolm C.,3,656,172.
Schroder, Karl-Heinz: *See—*
Kind, Guntram; Schroder, Karl-Heinz; and Busse, Rido,3,655,039.
Schueler, John A. Post shore. 3,655,161, Cl. 248-354.
Schuh, Frank J., to Atlantic Richfield Company. Drilling. 3,654,766, Cl. 61-50.000
Schullin Steel Company: *See—*
Wallace, George O., 3,654,871.
Schultz, Henry G.; Williams, Herschel C.; Neureiter, Norman P.; and Bown, Delos E., to Esso Research and Engineering Company. Polycarbonate stabilizer compositions. 3,655,718, Cl. 260-463.
Schulz, Gunter: *See—*
Sauer, Theo; and Schulz, Gunter,3,655,166.
Schumacher, Harold W. Silo unloader discharge tubes. 3,655,245, Cl. 302-59.

Schumann, Paul A., Jr.: *See*—
Duffy, Michael C.; Schumann, Paul A., Jr.; and Yeh, Tsu-Hsing,3,655,457.
Schumann, Robert T.: *See*—
Lieberman, Lee M.; and Schumann, Robert T.,3,655,288.
Schwartz, Joseph E., to Victronic, Inc. Electrically operated shutter mechanism for camera. 3,654,847, Cl. 95-63.
Schwarz, Maurice L., to EIS Automotive Corporation, The. Method and apparatus of assembling and disassembling hydraulic disc brake calipers. 3,654,689, Cl. 29-427.
Schweitzer, Earl O., to Vernitron Corporation, mesne. Impact type piezoelectric mechanism. 3,655,324, Cl. 431-258.
Schwenk, William E., to International Paper Company. Method of making side seam sealed container. 3,654,842, Cl. 93-94.
Schwer, Frederick W.; and Kean, Chester E., to California and Hawaiian Sugar Company. Method of making sugar and sugar products. 3,655,442, Cl. 127-58.
Sciavolino, Frank C.; Routien, John B.; Tynan, Edward J.; and Celmer, Walter D., to Pfizer Inc. Antibiotic CP-21,635. 3,655,876, Cl. 424-117.
SCM Corporation: *See*—
Hall, Roger P., 3,655,481.
Scoggin, Baxter I., Jr.; Vaughan, Woodrow E.; and Reed, Gerald D., to Modern Plastic Sales. Rake head. 3,654,754, Cl. 56-400.17
Scott, Edwin M., Jr. Process for die casting brass using a silicone lubricant. 3,654,985, Cl. 164-72.
Scott, Ernest R., to General Electric Company. Vacuum cleaner. 3,654,661, Cl. 15-333.
Seagreaves, George F., to General Motors Corporation. Method for making fiber optic assembly with crimped end connector. 3,655,275, Cl. 350-320.
Sear, Reginald; and Dean, Peter Mervyn, to National Research Development Corporation. Radio-isotope scanning machine for more clearly representing contours of equal radiation intensity. 3,655,973, Cl. 250-71.5
Sechak, Ronald P., to Xerox Corporation. Tri-layered selenium doped photoreceptor. 3,655,377, Cl. 96-1.5
Seeburger, Harold O.; and Horsley, Lee H., to Dow Chemical Company, The. Purification of phenylphenol from dibenzofuran by azeotropic distillation. 3,655,522, Cl. 203-59.
Seeburger, Harold O.; and Horsley, Lee H., to Dow Chemical Company, The. Method for separating a 2- and 4-chlorobiphenyl from the corresponding hydroxybiphenyl compounds. 3,655,523, Cl. 203-59.
Seeger, Ernst: *See*—
Nickl, Josef; Engel, Wolfhard; Eckenfels, Albrecht; Seeger, Ernst; and Engelhardt, Gunther,3,655,743.
Seelenbinder, Terrence G., to Addressograph-Multigraph Corporation. Automatic sheet separating apparatus. 3,655,184, Cl. 271-64.
Seglin, Leonard; and Winnicki, Henry S., to Intermountain Research & Development Corporation, mesne. Production of sodium carbonate. 3,655,331, Cl. 23-63.
Segredo, John D., to International Harvester Company. Multiple row forage harvester. 3,654,752, Cl. 56-98.
Sehring, Richard: *See*—
Becher, Heinz-Manfred; and Sehring, Richard,3,655,717.
Seim, William J., to Minnesota Mining and Manufacturing Company. Connector. 3,656,088, Cl. 339-98.
Seiner, Jerome A., to PPG Industries, Inc. Slow release films and methods of making same. 3,655,129, Cl. 239-60.
Seiner, Jerome A., to PPG Industries, Inc. Opaque, non-pigmented microporous film and process and composition for preparing the same. 3,655,591, Cl. 260-2.5
Seiter, Hartmut, to Siemens Aktiengesehlschaft. Method of producing thin layer components with at least one insulating intermediate layer. 3,655,439, Cl. 117-212.
Seitz, Karl; Klahre, Guenter; and Riat, Henri, to Ciba Limited. Process for the manufacture of dihalogentriazine derivatives. 3,655,662, Cl. 260-248.
Sekmakas, Kazys, to DeSoto, Inc. Silicone-containing hydrophylic resins dispersible in water. 3,655,602, Cl. 260-29.2
Sellet, Lucien, to Diamond Alkali Company, mesne. Alkoxylated Mannich base urethane prepolymer composition and method of preparation. 3,655,619, Cl. 260-47.
Selvin, Gerald J.: *See*—
Anhalt, John W.; Maston. James W.; and Selvin, Gerald J.,3,656,091.
Selwitz, Charles M.: *See*—
Bacha, John D.; and Selwitz, Charles M.,3,655,783.
Sempel, Hendrinus; and Potman, Hendrik, to Akjong Incorporated. Manufacture of drawn thermoplastic fibrillary products. 3,655,839, Cl. 264-40.
Sennewald, Kurt; Vogt, Wilhelm; Erpenbach, Heinz; and Glaser, Hermann, to Knapsack Aktiengesellschaft. Process for the manufacture of carboxylic acids. 3,655,747, Cl. 260-530.
Service (Engineers) Limited: *See*—
Bradshaw, Arthur; and Meadows, Frank William, 3,655,319.
Setzer, Herbert J., to United Aircraft Corporation. Hydrogen generator desulfurizer employing feedback ejector. 3,655,448, Cl. 136-86.
Setzler, Paul C., to Heli-Coil Corporation. System for insertion tool control. 3,654,688, Cl. 29-240.
Severynse, Gerard T.: *See*—
Fisher, Donald J.; and Severynse, Gerard T.,3,655,373.
Shachter, Moses; and Mikulin, Tom T., to Ford Motor Company. Steering system with powered recovery mechanism Personnel safety guard for machinery. 3,654,820, Cl. 74-612.
Shader, Benjamin A., to Eversman Mfg. Company, The. Photo-electric plant thinners. 3,654,998, Cl. 172-6.
Shah, Dineshchandra S.: *See*—
Lynch, Thomas; and Shah, Dineshchandra S.,3,655,033.
Shah, Dipak Co.; Ward, George W.; and Whiteley, Roger L., to Bethlehem Steel Corporation. Coated seamless containers and method of forming. 3,655,349, Cl. 29-196.4
Shah, Indravadan S., to Chemical Construction Corporation. Centrifugal filtration of magnesium sulfite slurries. 3,655,338, Cl. 23-129.
Shanklin, Samuel H.: *See*—
Wright, Kenneth N.; and Shanklin, Samuel H.,3,655,882.
Shankoff, Theodore Arthur: *See*—
Curran, Robert Kyran; Kerwin, Robert Eugene,; and Shankoff, Theodore Arthur,3,655,527.
Sharp, John R., to Polaroid Corporation. System for processing a strip of photographic material. 3,654,848, Cl. 95-89.
Sharp Kabushiki Kaisha: *See*—
Nakamura, Tutomu; Matsuda, Saburo; and Ito, Yoichi, 3,655,988.
Shaw, Joshua, & Sons Limited: *See*—
Bennett, Sydney, 3,654,760.
Shelton, Frederic J., to Reichhold Chemicals, Inc. Color stabilization of ortho-benzyl parachlorphenol. 3,655,779, Cl. 260-619.
Shelton, Marcus H.; and James, Ralph, Jr., to Esso Research and Engineering Company. Method for baling particulate synthetic elastomer. 3,655,851, Cl. 264-102.
Shely, Benjamin L.: *See*—
Shepard, Joseph W.; and Shely, Benjamin L.,3,655,383.
Shen, Tsung-Ying; Ruyle, William V.; Walford, Gordon L.; and Witzel, Bruce E., to Merck & Co., Inc. Certain aryl pyridine carboxylic acid derivatives. 3,655,679, Cl. 260-295.
Shen, Tsung-Ying; and Walford, Gordon L., to Merck & Co., Inc. 3-Amino-tetrahydrothiophene-3-carboxylic acids. 3,655,692, Cl. 260-332.2
Shen, Tsung-Ying; Witzel, Bruce E.; and Walford, Gordon L., to Merck & Co., Inc. Anti-inflammatory salicylic acid derivatives. 3,655,693, Cl. 260-332.2
Shen, Tsung-Ying; Witzel, Bruce E.; Walford, Gordon L.; and Ruyle, William V., to Merck & Co., Inc. Ortho-hydroxydibenzofuran carboxylic acid and acid derivatives substituted by a halogen atom. 3,655,697, Cl. 260-346.2
Shen, Tsung-Ying: *See*—
Jensen, Norman P.; Shen, Tsung-Ying; and Windholz, Thomas B.,3,655,901.
Shepard, Joseph W.; and Shely, Benjamin L., to Minnesota Mining and Manufacturing Company. Method for reproducing images of a solid photocatalyst with an oxidizing agent. 3,655,383, Cl. 96-64.
Shepelyakovsky, Konstantin Zakharovich: *See*—
Ostrovsky, Grigory Arkadievich; Orlovsky, Anatoly Georgievich; Nikonov, Vladimir Filippovich; Kalner, Veniamin Davydovich; Shklyarov, Isaak Nokhimovich; Stepin, Anatoly Loginovich; Bysink, Alexandr Moiseevich; Shepelyakovsky, Konstantin Zakharovich; and Smirnov, Stanislav Ivanovich,3,655,466.
Shepherd, Charles G., to Wilson Lighting Limited. Lighting unit structure and arrangement comprising a plurality of such structures. 3,654,849, Cl. 98-40.
Sherman, David A.: *See*—
Ludwig, David R.; and Sherman, David A.,3,656,072.
Sherman, Paul David; and Chloupek, Frank J., to Atlantic Richfield Company. Process for the preparation of zinc alkyl orthophosphates. 3,655,704, Cl. 260-429.9
Shibahara, Matthew: *See*—
Sifri, Elie C.; and Shibahara, Matthew,3,654,834.
Shibata, Motoo: *See*—
Higashide, Eiji; Hasegawa, Toru; Shibata, Motoo; and Mizuno, Komei,3,655,878.
Nakazawa, Koiti; Shibata, Motoo; Higashide, Eiji; Kanzaki, Toshihiko; Yamamoto, Hiroichi; Miyake, Akira; Ueyanagi, Jisaburo; and Iwasaki, Hidesuke,3,655,879.
Shiflet, Robert H., to Rohr Corporation. Apparatus for installing bushings. 3,654,685, Cl. 29-200.
Shih, I-Kao; and Blaser, Eric, to Warner-Lambert Company. Poly aluminum hydroxy complexes and process for their production. 3,655,329, Cl. 23-50.
Shimilevich, Izrail Yakovlevich. Power hydraulic cylinder. 3,654,838, Cl. 92-24.
Shimizu, Tetsuji: *See*—
Tanaka, Hiroshi; Naito, Shozo; and Shimizu, Tetsuji,3,656,103.
Shinohara, Yasuo: *See*—
Tamai, Isamu; Oyama, Minoru; Osakada, Atsushi; and Shinohara, Yasuo,3,655,542.
Shiraishi, Tetsuya; Utsugi, Jun; Tanaka, Koji; and Tokusa, Yasunori, to Takeda Chemical Industries, Ltd. Process for producing monosodium glutamate. 3,655,746, Cl. 260-527.
Shklyarov, Isaak Nokhimovich: *See*—
Ostrovsky, Grigory Arkadievich; Orlovsky, Anatoly Georgievich; Nikonov, Vladimir Filippovich; Kalner, Veniamin Davydovich; Shklyarov, Isaak Nokhimovich; Stepin, Anatoly Loginovich; Bysink, Alexandr Moiseevich; Shepelyakovsky, Konstantin Zakharovich; and Smirnov, Stanislav Ivanovich,3,655,466.
Shoemaker, James C., to Symons Corporation. Self-contained waler clamp assembly for concrete wall form. 3,655,162, Cl. 249-219.
Shuda, Donald G.: *See*—
Giles, George R.; and Shuda, Donald G.,3,656,064.

Siddall, John B., to Zoecon Corporation. Oxygenated unsaturated aliphatic carboxylic acids and esters. 3,655,700, Cl. 260-405.

Siegal, Burton L., to Orbitex, Inc. Method of making honeycomb core. 3,655,476, Cl. 156-197.

Siegal, Burton L.: *See—*
Stelling, Walter R., Jr.; Siegal, Burton L.; and Talbott, Michael M.,3,655,475.

Siemens Aktiengesehlschaft: *See—*
Seiter, Hartmut, 3,655,439.

Siemens Aktiengesellschaft: *See—*
Gerke, Peter; Rutkowski, Karl; and Bock, Helmuth Joachim, 3,655,922.
Longo, Hans-Eberhard; Keller, Wolfgang; and Vogel, Carl-Heinz, 3,655,345.
Schettler, Kurt, 3,655,207.
Speth, Winfried, 3,655,954.
Stein, Karl-Ulrich, 3,656,106.
Trattner, Herman; and Leibhard, Erich, 3,654,897.
Wilhelm, Wilhelm, 3,655,998.

Siempelkamp, G., & Co.: *See—*
Husges, Walter, 3,655,316.

Sievenpiper, Donald A., to A-T-O Inc. Regeneration valve. 3,654,835, Cl. 91-436.

Sievenpiper, Ward, to A-T-O Inc. Rod wiper. 3,655,204, Cl. 277-24.

Sifri, Elie C.; and Shibahara, Matthew, to Cascade Corporation. Fluid bypass valve. 3,654,834, Cl. 91-399.

Sigg, Hans-Peter: *See—*
Bollinger, Pietro; Harri, Eugen; and Sigg, Hans-Peter,3,655,880.

Signal Chemical Company: *See—*
Anderson, John E.; Parish, Clyde E.; and Ross, George H., 3,655,719.

Signal Oil and Gas Company: *See—*
Kasperik, Archibald S.; and Fuchs, Herbert A., 3,655,621.

Silver Recovery Equipment Pty., Limited: *See—*
Zeleny, Victor Vaclav; and Zeleny, Peter Charles, 3,655,175.

Silverman, Daniel, to Amoco Production Company. Tethered platform flotation. 3,654,886, Cl. 114-0.5

Simmen, Fred G., to Hall China Company. Manufacture of disposable ceramic dishes from high alkali pyrophyllite. 3,655,843, Cl. 264-59.

Simmonds Precision Products, Inc.: *See—*
Akeley, Lloyd T., 3,656,101.

Simons, Jon W.: *See—*
Bourke, Robert F.; and Simons, Jon W.,3,656,006.

Sinclair, Fred G. Lock with readily interchangeable key. 3,654,783, Cl. 70-349.

Singer, Malcolm Scott, to Chevron Research Company. Imidazolidinedione herbicides. 3,655,689, Cl. 260-309.5

Singer, Robert B.; Muir, Earl B.; and Kotzar, Andrew J., to White Motor Corporation. Multiple countershafts transmission. 3,654,822, Cl. 74-681.

Sinkula, Anthony A.: *See—*
Morozowich, Walter; and Sinkula, Anthony A.,3,655,885.

Sizer, Phillip S., to Otis Engineering Corporation. Fluid circulating method and system for wells. 3,654,995, Cl. 166-313.

Skalsey, Lily G., to Lear Siegler, Inc. Expanding arbor for tapered holes. 3,654,797, Cl. 72-393.

SKF Industries, Inc.: *See—*
Crecelius, William J., 3,655,252.

Skille, Peter W. Fence corner. 3,655,167, Cl. 256-35.

Skinner, Harvey G., to Vulcan, Inc. Pallet constructions. 3,654,874, Cl. 108-51.

Slagel, Robert Clayton; and Bloomquist, Arnold Eugene, to Calgon Corporation. Friction reducing in a flowing hydrocarbon fluids. 3,654,994, Cl. 166-308.

Slight, David Laurie. Ionizing radiation apparatus and method for distinguishing between materials in mixture. 3,655,964, Cl. 250-43.5

Smirnov, Stanislav Ivanovich: *See—*
Ostrovsky, Grigory Arkadievich; Orlovsky, Anatoly Georgievich; Nikonov, Vladimir Filippovich; Kalner, Veniamin Davydovich; Shklyarov, Isaak Nokhimovich; Stepin, Anatoly Loginovich; Bysink, Alexandr Moiseevich; Shepelyakovsky, Konstantin Zakharovich; and Smirnov, Stanislav Ivanovich,3,655,466.

Smith, Brian Lawrence; and Robertson, Rodger William, to Angus, George, & Company Limited. Manufacture of hose pipes. 3,655,310, Cl. 425-109.

Smith, Charles Philip: *See—*
Greenland, Leonard Sidney; Smith, Charles Philip; and Marshall, David,3,655,134.

Smith, Clarence D., Jr. Garbage can holder. 3,655,158, Cl. 248-154.

Smith, Dale L.: *See—*
Piper, Douglas E.; Jarvis, James G.; and Smith, Dale L.,3,654,893.

Smith, Dennis Clifford, to National Research Development Corporation. Surgical cements from zinc oxide and aqueous poly(acrylic acid). 3,655,605, Cl. 260-29.6

Smith, Frank W.; and Parker, Patrick N., to Atlantic Richfield Company. Method for inhibiting corrosion in a well. 3,654,993, Cl. 166-279.

Smith, Harry A. Flexible skin package. 3,654,744, Cl. 53-22.

Smith, Harry R., to International Telephone and Telegraph Corporation. Tiltable antenna. 3,656,170, Cl. 343-882.

Smith Industries Limited: *See—*
McDonald, Thomas Victor; and Stockley, Kenneth McDonald, 3,656,090.

Smith, James C.: *See—*
Keig, George A.; Smith, James C.; and Watts, John M. J.,3,655,415.

Smith, James J.: *See—*
Prouty, Robert E.; Gilman, John E., III; and Smith, James J.,3,656,076.

Smith Kline & French Laboratories: *See—*
Fielden, Roy; Green, Albert Lawrence; and Hills, Derek William, 3,655,757.
Grass, George M., Jr.; and Unangst, Raymond R., 3,655,864.
Kaiser, Carl; and Zirkle, Charles L., 3,655,667.
Kaiser, Carl; and Ross, Stephen T., 3,655,676.

Smith Kline Instruments, Inc.: *See—*
Kienitz, Martin E., 3,655,095.

Smith, Lowell R.; and Speziale, Angelo John, to Monsanto Company. Trihalothionoacetamides. 3,655,646, Cl. 260-239.

Smith, Lyle Douglas. Unauthorized entry indicator and method. 3,656,143, Cl. 340-274.

Smith, Michael John; and Lane, William Charles, to Reed Paper Group Limited. Method of and apparatus for packing articles. 3,654,745, Cl. 53-26.

Smith, Richard D.; and Furlong, Dale A., to Combustion Power Company, Inc. Fluidized bed vapor compression drying apparatus and method. 3,654,705, Cl. 34-10.

Smith, Terry Edward, to American Cyanamid Company. Compatible mixtures of methyl methacrylate polymer and high molecular weight ethylene oxide polymer. 3,655,830, Cl. 260-901.

Smith, Walter J.; and Rafferty, John W., to Parker Pen Company, The, mesne. Correctable graphic system. 3,655,427, Cl. 117-76.

Smith, William Novis, Jr., to Foote Mineral Company. Process for preparing lithium compounds of the formula LiMF wherein M is arsenic or antimony. 3,655,332, Cl. 23-88.

Smithe, F. L., Machine Company, Inc.: *See—*
Helm, Herbert W.; and Weir, Edgar V., 3,656,036.

Snape, Edwin; and Schaller, Frank W., to International Nickel Company, Inc., The. Heat treatment for alloys particularly steels to be used in sour well service. 3,655,465, Cl. 148-134.

Snyder, Steve Enterprises, Inc.: *See—*
Puskas, Elek, 3,655,924.

Societe Anonyme dite: Orsymonde: *See—*
Lafon, Victor, 3,655,776.

Societe Anonyme dite: Societe Nationale des Petroles d'Aquitaine:*See—*
Amiard, Yves; and Bellissent, Jean-Paul, 3,655,796.

Societe d'Appareils de Controle et d'Equipment des Moleurs S.A.C.E.M.:*See—*
Mennesson, Bernard Rene, 3,655,015.

Societe des Accumulateurs Fixes et de Traction (Societe Anonyme): *See—*
Gerbier, Gerard Marcel; and Dechenaux, Victor Louis, 3,655,446.

Societe Eth Ylene Plastique: *See—*
Boucheron, Bernard, 3,655,634.

Societe Industrielle de Brevets et d'Etudes S.I.B.E.:*See—*
Mennesson, Andre Louis, 3,654,905.

Societe Nationale des Petroles d'Aquitaine:*See—*
Meharry, James L., 3,654,751.

Societe Nationale des Petroles d'Aquitaine Tour Aquitaine:*See—*
Labat, Yves, 3,655,774.

Societe Rhodiaceta: *See—*
Rajon, Andre, 3,655,326.

Solartron Electronic Group Limited, The: *See—*
Ley, Anthony John, 3,655,956.

Solheim, Karsten. Correlated golf club set. 3,655,188, Cl. 273-77.

Somerset, James H. Cassette. 3,655,972, Cl. 250-67.

Sommer, Harald, to Braunschweigische Maschinenbauanstalt. Auxiliary device for centering of the centrifugal drum of pendulum type hydro extractors during clearing with a high number of revolutions. 3,655,124, Cl. 233-46.

Sommers, Hans: *See—*
Schmalfeld, Paul; Sommers, Hans; and Janssen, Heinrich,3,655,518.

Sone, Yasuo: *See—*
Uchida, Shinzi; Nishizawa, Hiroshi; and Sone, Yasuo,3,655,628.

Sony Corporation: *See—*
Kubota, Yasuharu, 3,655,909.

Sopp, Albert L., Jr., to Aluminum Company of America. Etching of aluminum base alloys. 3,655,467, Cl. 156-22.

Sorenson, Paul H.: *See—*
Laakaniemi, Richard N.; Munch, Otto R.; and Sorenson, Paul H.,3,654,944.

Sorvall, Ivan, Inc.: *See—*
Williams, John F., 3,655,293.

Soto-Krebs, Luis A., to ESB Incorporated. Battery electrode and method of making the same. 3,655,450, Cl. 136-107.

Souder, Louis C.; Larsson, Bjorn E.; and Ryan, Charles F., to Rohm & Haas Company. Acrylic impact resistant modifiers for polyvinyl chloride. 3,655,825, Cl. 260-876.

Soukup, Robert J.: *See—*
Parliment, Thomas H.; Clinton, William P.; Scarpellino, Richard; Soukup, Robert J.; and Epstein, Martin F.,3,655,397.

Soviche, Gilles Andre Paul; Bues, Jean Pierre; Pavlin, Cyrille Francois; and Mace, Edouard Maurice Eugene Aime, to Entreprise de Recherches et d'Activites Petrolieres Elf, and Bertin & Cie. Regulating device in which the pressure of a fluid is regulated. 3,654,945, Cl. 137-81.5

Span, Samuel; and Thum, Walter. Toy. 3,654,727, Cl. 46-17.

Spangler, Ross; and Materre, Christine, to Helene Industries, Inc. Stretch wigs. 3,654,938, Cl. 132-53.
Sparkler Manufacturing Company: *See—*
Kracklauer, Aloysius C., 3,655,049.
Spausuzus, Siegfried, to Kiengle Apparate GmbH. Apparatus for automatically evaluating recordings on a record carrier. 3,655,948, Cl. 235-61.9
Spectra-Mat, Inc.: *See—*
Cronin, Leo J., 3,656,020.
Spectrum Infrared, Inc.: *See—*
Tomsic, Raymond F., 3,655,942.
Speicher, Edwin W.; and Fry, Charles E., Jr., to Cunningham, M. E., Company. Position indicator for a multiple character marking device. 3,654,860, Cl. 101-110.
Spencer, Richard O.: *See—*
Taylor, William W.; and Spencer, Richard O.,3,654,660.
Sperry Rand Corporation: *See—*
Chen, Chung-Ho; and Thomas, Roy D., 3,656,003.
Chen, Chung-Ho, 3,656,009.
Conway, Patrick H., 3,656,109.
Ostergren, William F.; and Hurlburt, Joseph C., 3,654,749.
Reid, Gilbert R., 3,656,127.
Speth, Winfried, to Siemens Aktiengesellschaft. Closed loop control system with automatic variation of its regulating feedback amplification. 3,655,954, Cl. 235-150.1
Speziale, Angelo John: *See—*
Smith, Lowell R.; and Speziale, Angelo John,3,655,646.
Spietschka, Ernst; and Ische, Friedrich, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. 3-Hydroxy-4-sulfone quinophthalone dyestuffs and process for making them. 3,655,670, Cl. 260-283.
Spietschka, Ernst; and Ische, Friedrich, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Quinophthalone dyestuffs and process for preparing them. 3,655,672, Cl. 260-289.
Spivack, John Denon, to Ciba-Geigy Corporation. Stabilized polyolefin compositions containing alkylated-hydroxyphenyl-alkylphosphinates. 3,655,614, Cl. 260-45.95
Spivy, Paul L., to Phillips Petroleum Company. Method of intermittently severing continuously formed extrudate. 3,655,856, Cl. 264-150.
Sport Games, Inc.: *See—*
Imperato, Joseph, 3,654,729.
Sprecher & Schuh AG: *See—*
Mayer, Georg; and Glaser, Egon, 3,655,254.
Spreitzer, Franz: *See—*
Lorcher, Harry; and Spreitzer, Franz,3,655,017.
Sprenger, Walter. Brown-Boveri-Sulzer Turbomachinery, Ltd.. 3,655,250, Cl. 308-160.
Springer, Gordon K.: *See—*
DeMaine, Paul A. D.; and Springer, Gordon K.,3,656,178.
Spruill, Durward L.: *See—*
Bloom, John A.; Spruill, Durward L.; and Wakefield, Gene F.,3,654,895.
Square D Company: *See—*
Ries, Robert G.; and Montross, Robert C., 3,656,038.
Turnbull, Merlin Y., 3,655,934.
Srivastava, Keshava; and Dixon, Samuel J., to Honeywell Information Systems, Inc. Three frequency data separator. 3,656,149, Cl. 340-347.
Stach, Kurt: *See—*
Weber, Helmut; Weyer, Rudi; Aumuller, Walter; Muth, Karl; and Stach, Kurt,3,655,756.
Stad Alarm Systems, Inc.: *See—*
Beltrami, Joseph P., 3,656,100.
Staib, Armando: *See—*
Staib, Armando, 3,654,920.
Staib, Armando, to Esch, Erika, executrix of the estate of Staib, Armando. Traction devices for orthopedic tables. 3,654,920, Cl. 128-71.
Staley, A. E., Manufacturing Company: *See—*
Wright, Kenneth N.; and Shanklin, Samuel H., 3,655,882.
Staley, Walton F., Jr.; and Staley, Walton F., Jr., to Leeds & Northrup Company Leeds & Northrup Company. Recording module for a recorder Recording module for a recorder. 3,656,176, Cl. 346-145.
Staley, Walton F., Jr.: *See—*
Staley, Walton F., Jr.; and Staley, Walton F., Jr.,3,656,176.
Stamicarbon, N.V.: *See—*
deRooij, Abraham H.; and Elemndorp, Jan, 3,655,760.
Standard Oil Company: *See—*
Poppe, Wassily; Khelghatian, Habet M.; and Fitzpatrick, James E., 3,655,433.
Standard Oil Company, The (Ohio): *See—*
Isley, Ralph E., 3,656,027.
Stanevich, Anthony, to Teletype Corporation. Selective positioning mechanisms for platens or the like. 3,655,023, Cl. 197-114.
Stanley, Hugh E.; and Tokos, George M., to Crown Zellerbach Corporation. Package of composite film with peelable, heatsealable surfaces. 3,655,503, Cl. 161-165.
Staples, Paul R., to General Electric Company. Hydraulic thermostat with double throw switch mechanism. 3,656,182, Cl. 337-319.
State National Bank: *See—*
Alexander, Delbert S., Jr., 3,655,189.
Statni Vyzkumny Ustav Kozedelny: *See—*
Plechac, Bohuslav, 3,654,781.
Stauffer Chemical Company: *See—*
Gutman, Arnold D., 3,655,761.
Stauffer-Wacker Silicone Corporation, : *See—*
Lengnick, Guenther Fritz; and Lengnick, Guenther Fritz, 3,655,705.
Steele, Duane R.: *See—*
Rylander, Paul N.; and Steele, Duane R.,3,655,777.
Stehling, Chas. H., Company: *See—*
Horn, Arthur H., 3,655,024.
Stein, Karl-Ulrich, to Siemens Aktiengesellschaft Evaluation circuit for the determination of. information sensed from matrix memories. 3,656,106, Cl. 340-146.1
Stein, William B., to Warner & Swasey Company, The. Cutoff tool having improved chip relieving surface. 3,654,681, Cl. 29-95.
Steinbronn, George J.: *See—*
Chung, Seng Fang; Kuechler, William L.; and Steinbronn, George J.,3,656,177.
Steiner, Daniel N.: *See—*
Hall, Harold G.; and Palmer, Rufus N., 3,655,092.
Stella, Gianfranco, to MPM-Materiali Protettivi Milano S.r.L. Preservative and impervious surface coating paste. 3,655,612, Cl. 260-41.5
Stelling, Walter R., Jr.; Siegal, Burton L.; and Talbott, Michael M., to Orbitex, Inc. Method of and apparatus for making honeycomb core. 3,655,475, Cl. 156-197.
Steltzer, Ernest R.; and Nitsch, Edward J., to Dietz, R. E., Co. Vehicle marker light having metal strap extending into cupped lens. 3,656,105, Cl. 340-119.
Stenger, Vernon A.; and Kramer, Walter R., to Dow Chemical Company, The. Process for producing anhydrous sodium chloride and purified saturated brine. 3,655,333, Cl. 23-89.
Stephan, Hans: *See—*
Eggensperger, Heinz; Franzen, Volker; and Stephan, Hans,3,655,833.
Stepin, Anatoly Loginovich: *See—*
Ostrovsky, Grigory Arkadievich; Orlovsky, Anatoly Georgievich; Nikonov, Vladimir Filippovich; Kalner, Veniamin Davydovich; Shklyarov, Isaak Nokhimovich; Stepin, Anatoly Loginovich; Bysink, Alexandr Moiseevich; Shepelyakovsky, Konstantin Zakharovich; and Smirnov, Stanislav Ivanovich,3,655,466.
Sterling Drug Inc.: *See—*
Ackerman, James H., 3,655,669.
Ackerman, James H.; and Laidlaw, George M., 3,655,752.
Carabateas, Philip M., 3,655,675.
Page, Donald E., 3,655,691.
Sterling, Henley Frank; and Swann, Richard Charles George, to International Standard Electric Corporation. Method of forming silicon oxide coatings in an electric discharge. 3,655,438, Cl. 117-201.
Stern, Jason L. Self-opening envelope. 3,655,120, Cl. 229-86.
Sternal, Lambert S., to Tsmesavers Sanders, Inc. Method of and apparatus for effecting superior sanding. 3,654,738, Cl. 51-139.
Sternberg, Moshe, to Miles Laboratories, Inc. Purification of protease. 3,655,513, Cl. 195-66.
Stero N.V.: *See—*
Stevens, Simon, 3,654,644.
Steude, Heinrich: *See—*
Brandt, Hans-Walther; Engelhard, Bruno; Steude, Heinrich; Scherb, Helmut; Schleppinghoff, Bernhard; and Schnuchel, Gunther,3,655,806.
Stevens, Bernard, to General American Transportation Corporation. Stamp dispensing machine. 3,655,109, Cl. 226-46.
Stevens, Simon, to Stero N.V. Stretcher. 3,654,644, Cl. 5-81.
Stevens, Stephen S., 50% to Sankary, Morris. Flame resistant materials and methods for producing same. 3,655,600, Cl. 260-2.5
Steves, Clarence: *See—*
Brak, Stephen B.; Steves, Clarence; and Mayfield, Ross M.,3,654,794.
Stevick, Lawrence E.: *See—*
Kohn, Gustave K.; and Stevick, Lawrence E.,3,655,780.
Stewart, Ted, to General Motors Corporation. Retractable closure. 3,655,238, Cl. 296-107.
Stiles, Alvin Barber: *See—*
Linn, William Joseph; and Stiles, Alvin Barber,3,655,724.
Stiles, Donald G.: *See—*
Webb, Joseph H.; and Stiles, Donald G.,3,655,029.
Stocker, August: *See—*
Arni, Urs; Faucci, Adriano; and Stocker, August,3,655,721.
Stockley, Kenneth McDonald: *See—*
McDonald, Thomas Victor; and Stockley, Kenneth McDonald,3,656,090.
Stoecker & Kunz GmbH: *See—*
Winkler, Hans-Joachim; and Fehling, Hans Richard, 3,655,176.
Stollman, Irving; and Banaitis, Raymond, to Polycon Industries, Inc. Shipping container. 3,655,034, Cl. 206-1.
Stora Kapparbergs Bergslags Aktiebolag: *See—*
Hagdahl, Erik Lennart, 3,655,060.
Storkebaum, Christoph: *See—*
Dorschner, Oskar; Carduck, Franz Josef; Storkebaum, Christoph; and Rother, Claus,3,655,862.
Stowe, Richard W., to Melpar, Inc. Hydrogen-filled gas detector having cathode helix supported by envelope wall. 3,656,019, Cl. 313-217.
Stoy, Franz; and Eder, Heinz, to Metabowerke KG. Belt grinding or polishing machine. 3,654,739, Cl. 51-141.
Strache, Hanns; and Dammermann, Rolf, to Chemische Werke Huels

A.G. Recovery of crude cis, trans, trans- cyclododecatriene-1,5,9 having a low chlorine content. 3,655,794, Cl. 260-666.

Strand, Sanford M.: *See—*
Greening, Donald J.; Kintner, Paul M.; and Strand, Sanford M.,3,655,950.

Strassel, Albert Pierre, to Wyandotte Chemicals Corporation. Single-step process for preparing a cellular product having a very compact elastomeric skin. 3,655,597, Cl. 260-2.5

Stratford Industries, Inc.: *See—*
Lehman, Harry W., 3,654,734.

Straus, Alan E., to Chevron Research Company. Water-containing dry cleaning compositions. 3,655,572, Cl. 252-171.

Strickler, Allen, to Beckman Instruments, Inc. Continuous electrophoresis cell with lateral pH gradient. 3,655,541, Cl. 204-180.

Strohschneider, Heinz F., to Farrington Business Machines Corporation. Traveling cylinder printer with platen movement responsive document clamping means. 3,654,862, Cl. 101-269.

Strolle, Clifford H., to Du Pont de Nemours, E. I., and Company. Coating compositions containing fluorocarbon polymer and colloidal silica. 3,655,604, Cl. 260-29.6

Stromquist, Michael E., to Anthony's Manufacturing Company, Inc. Safety device for multi-pane glass refrigerator doors. 3,655,939, Cl. 219-218.

Stropki, George T.; and Stropki, George T., to North American Rockwell Corporation North American Rockwell Corporation. Spiral antenna with overlapping turns Spiral antenna with overlapping turns. 3,656,168, Cl. 343-895.

Struttman, Lloyd G.: *See—*
Montgomery, James R.; and Struttman, Lloyd G.,3,655,981.

Stuart, James L.: *See—*
Woodham, George W.; and Stuart, James L.,3,655,850.

Studtmann, George H.: *See—*
Yarema, Raymond J.; and Studtmann, George H.,3,656,047.

Stumpe, Warren R.: *See—*
Carder, Frank B.; Stumpe, Warren R.; Frassetto, Bruno S.; and Bell, Charles H.,3,655,075.
Carder, Frank B.; Stumpe, Warren R.; Frassetto, Bruno S.; and Bell, Charles H.,3,655,076.

Sturba, Bruno: *See—*
Grilli, Umberto; Sturba, Bruno; and Vivani, Artemio,3,654,831.

Sturm, Hans Juergen; Armbrust, Herbert; Nienburg, Hans; and Eisfeld, Wolfgang, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of O-benzoylbenzoic acid. ,365,574, Cl. 260-517.

Sturm, Ruger & Co., Inc.: *See—*
Ruger, William B., 3,654,720.

Sturmer, Hans, to Bosch, Robert, G.m.b.H. Sealing device for pistons of rotary piston machines. 3,655,304, Cl. 418-124.

Suckfull, Fritz: *See—*
Nickel, Horst; and Suckfull, Fritz,3,655,740.

Suenaga, Kazuo: *See—*
Kato, Tetsuji; Izumi, Mikio; Hayashibara, Yuji; and Suenaga, Kazuo,3,655,824.

Sugano, Izuru: *See—*
Akashi, Tsuneo; Sugano, Izuru; Okuda, Taneaki; Onodo, Yoshihiro; and Tsuji, Toshiro,3,655,841.

Sugihara, John Y.: *See—*
Murakami, Keisuke, 3,656,042.

Suh, John T.; and Schnettler, Richard A., to Colgate-Palmolive Company. 1,2-Disubstituted benzo [b] quinolizines. 3,655,671, Cl. 260-288.

Sullivan, Bernard P.: *See—*
Dey, Arabinda N.; and Sullivan, Bernard P.,3,655,585.

Sullivan, David Lee, to Du Pont de Nemours, E. I., and Company. Trimerization of butadiene. 3,655,795, Cl. 260-666.

Sullivan, Herbert: *See—*
Arbuckle, Timothy; and Sullivan, Herbert,3,656,108.

Sumitomo Chemical Company, Limited: *See—*
Tadenuma, Hachiro; Murakami, Torajiro; and Mitsushima, Hirotsugu, 3,655,771.
Yamamoto, Keisaku; Takao, Hiroyoshi; Hirooka, Masaaki; and Oshima, Teruo, 3,655,583.

Sumitomo Chemical Company, Ltd.: *See—*
Kitamura, Shige Yoshi; Hirai, Hajime; Okuno, Yositosi; and Fujimoto, Keimei, 3,655,654.

Sun Koki Kabushiki Kaisha: *See—*
Yasuo, Suzuki, 3,655,271.

Sun Oil Company: *See—*
Driscoll, Gary L., 3,655,808.
Kirsch, Francis W.; Potts, John D.; and Barmby, David S., 3,655,813.
Moore, Robert E., 3,655,782.

Sundstrand Data Controls, Inc.: *See—*
Bateman, Charles Donald, 3,654,806.

Superior Manufacturing Company: *See—*
Dorn, Chester, 3,655,101.

Supfina, Wieck & Hantzen: *See—*
Schmidt, Thomas, 3,654,737.

Surerus, Robert A. Thermoformed plastic container. 3,655,111, Cl. 229-7.

Surpless, Susan R., to Johnson & Johnson. Protective shield for holding sanitary napkins and method of making. 3,654,927, Cl. 128-290.

Susquehanna Corporation, The: *See—*
Walker, Jimmy Aubrey, 3,655,289.

Suzuki, Takashi: *See—*
Takeda, Ikuo; Suzuki, Takashi; and Furukawa, Hikaru,3,656,153.

Suzuki, Takeo: *See—*
Tanaka, Katsunobu; and Suzuki, Takeo,3,655,512.

Svenska Cellulosa Aktiebolaget: *See—*
Nilsson, Marit Gunnel Matilda; Udden, Ruth Gunvor Anna Britt; Udden, Per Edward Carl; and Wennerblom, Bengt Axel, 3,654,929.

Swann, Richard Charles George: *See—*
Sterling, Henley Frank; and Swann, Richard Charles George,3,655,438.

Swanson, John J.: *See—*
Reed, William A.; Kinzer, William K.; Swanson, John J.; and Kusner, Robert E.,3,655,837.

Swanson, Ronald R.: *See—*
Mattison, Philip L.; and Swanson, Ronald R.,3,655,347.

Sweeney, Richard F.: *See—*
Anello, Louis G.; Sweeney, Richard F.; and Litt, Morton H.,3,655,677.

Swengel, Robert Charles, Sr.; and Lemke, Timothy Allen, to AMP Incorporated. Terminal device for welded termination of electrical leads. 3,656,092, Cl. 339-213.

Swietlik, Joseph M.: *See—*
Marsh, John F.; and Swietlik, Joseph M.,3,655,557.

Swift, Harold E.: *See—*
Ondrey, John A.; and Swift, Harold E.,3,655,749.
Ondrey, John A.; and Swift, Harold E.,3,655,750.

Swisher, James A., to International Tool Sales, Inc. Impact driven tool with replaceable cutting point. 3,655,244, Cl. 299-91.

Switchcraft, Inc.: *See—*
Bailey, James R., 3,656,089.

Sybron Corporation: *See—*
Gertsen, Kai, 3,655,069.

Sylvania Electric Products, Inc.: *See—*
Faria, Sixdeniel; and Williams, Lyle K., 3,655,575.
Faria, Sixdeniel; and Harrigan, David J., 3,655,978.
Layman, Harry D.; and Taylor, Robert E., 3,655,576.
Overstreet, Scott M., 3,656,059.
Reynolds, Richard S., 3,655,268.
Wheeler, Robert Charles, 3,655,916.

Symons Corporation: *See—*
Shoemaker, James C., 3,655,162.

Systematics, Inc.: *See—*
Kuehn, Andrew, III, 3,654,910.

Systronics Incorporated: *See—*
Reynal, Thomas J., 3,656,066.

Tabares, Gilbert; and Clifford, Joseph, to International Telephone and Telegraph Corporation. Switching device with cams pivotal about an axis parallel to the plane of movement of switch plungers. 3,655,932, Cl. 200-153.

Tadenuma, Hachiro; Murakami, Torajiro; and Mitsushima, Hirotsugu, to Sumitomo Chemical Company, Limited, mesne. Process for producing formaldehyde. 3,655,771, Cl. 260-603.

Tadini, Costantino: *See—*
Ullmann, Werner; Tadini, Costantino; and Salim, Ehsan,3,655,937.

Tahara, Tetsuya: *See—*
Nakanishi, Michio; Tahara, Tetsuya; Imamura, Hiroshi; and Maruyama, Yutaka,3,655,681.
Nakanishi, Michio; Tahara, Tetsuya; Imamura, Hiroshi; and Maruyama, Yutaka,3,655,682.

Takahara, Masaki. Polycondensed acid composition and production thereof. 3,655,629, Cl. 260-78.4

Takahashi, Ikuzo: *See—*
Yasuhara, Yutaka; Nogi, Tatsuo; and Takahashi, Ikuzo,3,655,744.

Takahashi, Toru, to Iwatsu Electric Company Limited. Protective circuit for input circuit of junction type field effect transistor. 3,655,996, Cl. 307-202.

Takamatsu, Yasuto; Ishii, Toshio; Hayami, Toshio; and Tsubota, Yoshiharu, to Takeda Chemical Industries, Ltd. Compositions for treatment of toxoplasmosis and coccidiosis. 3,655,887, Cl. 424-229.

Takamune, Hirotoki, to Citizen Watch Co., Ltd. Amplitude adjuster in an electronic timepiece. 3,654,757, Cl. 58-23.

Takao, Hiroyoshi: *See—*
Yamamoto, Keisaku; Takao, Hiroyoshi; Hirooka, Masaaki; and Oshima, Teruo,3,655,583.

Takata, Toshikatsu: *See—*
Yamamoto, Shohei; Watanabe, Jun; Hosoi, Susumu; Kuwazaki, Masahiro; Ota, Akira; Takata, Toshikatsu; and Asaoka, Junichi,3,655,449.

Takeda Chemical Industries, Ltd.: *See—*
Higashide, Eiji; Hasegawa, Toru; Shibata, Motoo; and Mizuno, Komei, 3,655,878.
Isono, Masao; Tomoda, Katsumi; Miyata, Kouichi; Maejima, Kazutaka; and Tsubaki, Keisuke, 3,655,570.
Kono, Reisaku; Yamamoto, Shigeo; and Yaoi, Hideaki, 3,655,872.
Nakazawa, Koiti; Shibata, Motoo; Higashide, Eiji; Kanzaki, Toshihiko; Yamamoto, Hiroichi; Miyake, Akira; Ueyanagi, Jisaburo; and Iwasaki, Hidesuke, 3,655,879.
Shiraishi, Tetsuya; Utsugi, Jun; Tanaka, Koji; and Tokusa, Yasunori, 3,655,746.
Takamatsu, Yasuto; Ishii, Toshio; Hayami, Toshio; and Tsubota, Yoshiharu, 3,655,887.

Takeda, Ikuo; Suzuki, Takashi; and Furukawa, Hikaru, to Takeda

Riken Industry Company Limited. Analogue-digital converting apparatus. 3,656,153, Cl. 340-347.

Takeda Riken Industry Company Limited: *See—*
Takeda, Ikuo; Suzuki, Takashi; and Furukawa, Hikaru, 3,656,153.

Takeshima, Akio; Ueyama, Tadashi; Ohki, Akinori; and Mori, Tetsuo, to Toa Gosei Chemical Industry Co., Ltd. Process for the production of a foamed thermoplastic resin sheet. 3,655,470, Cl. 156-79.

Takeuchi, Tomio: *See—*
Umezawa, Hamao; Maeda, Kenji; Takeuchi, Tomio; Nitta, Kazuo; Okami, Yoshiro; and Ogawara, Hiroshi,3,655,877.

Taki, Akio: *See—*
Goto, Yasuo; and Taki, Akio,3,655,396.

Takimoto, Masaaki; Sato, Masamichi; and Honjo, Satoru, to Xerox Corporation. Electric charging device for electrophotography. 3,655,966, Cl. 250-49.52

Talbot, James R.: *See—*
Binford, Jack C.; Ethridge, Fredrick A.; and Talbot, James R.,3,654,677.

Talbott, Michael M.: *See—*
Stelling, Walter R., Jr.; Siegal, Burton L.; and Talbott, Michael M.,3,655,475.

Tamai, Isamu; Oyama, Minoru; Osakada, Atsushi; and Shinohara, Yasuo, to Toray Industries, Inc. Modified cellular particle and process for the production thereof. 3,655,542, Cl. 204-159.2

Tamai, Tasuo, to Fuji Photo Film Co., Ltd. Method for forming dye image using an electrophotographic developer containing a gelatin toner. 3,654,865, Cl. 101-463.

Tamai, Yasuo; Matsumoto, Seiji; and Honjo, Satoru, to Fuji Photo Film Co., Ltd. Electrophotographic reversal developing process. 3,655,419, Cl. 117-17.5

Tamplen, Jack W.: *See—*
Fredd, John V.; and Tamplen, Jack W.,3,654,962.

Tamuki, Minoru: *See—*
Ohno, Isamu; Kobayashi, Akio; Ohte, Akira; Tamuki, Minoru; and Ohta, Susumu,3,655,992.

Tanaka, Hiroshi; Naito, Shozo; and Shimizu, Tetsuji, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Vehicle's direction indicating lamp and brake lamp for combination use. 3,656,103, Cl. 340-67.

Tanaka, Katsunobu; and Kimura, Kazuo, to Kyowa Hakko Kogyo Co., Ltd. Process for preparing amino acids from hydrocarbons. 3,655,510, Cl. 195-28.

Tanaka, Katsunobu; and Suzuki, Takeo. Process for producing saccharides by fermentation. 3,655,512, Cl. 195-28.

Tanaka, Koji: *See—*
Shiraishi, Tetsuya; Utsugi, Jun; Tanaka, Koji; and Tokusa, Yasunori,3,655,746.

Tanaka, Masao; Kagawa, Tsuneo; Mochizuki, Kazuo; and Kohagura, Masahiro, to Kyowa Hakko Kogyo Co., Ltd. Process for purifying L-asparaginase. 3,655,514, Cl. 195-66.

Tandara, Milan, to Bosnalijek. Synthesis of ξ-aminocaproic acid from ξ-caprolactam. 3,655,748, Cl. 260-534.

Tangorra, Giorgio, to Industrie Pirelli S.p.A., mesne. Process for producing a hollow body of a non-developable form from a starting material of a developable form. 3,655,454, Cl. 156-132.

Tanner, Donald M., to Container Corporation of America. Flap lock container. 3,655,116, Cl. 229-39.

Tatsumi, Ryuji: *See—*
Miyauchi, Tsuneshige; Hirano, Jiro; Ueki, Atsufumi; Tatsumi, Ryuji; Mukai, Kunihiro; and Yoshikawa, Shogon,3,655,259.

Tatsuta, Yoshio, to ISE Electronics Corporation. Switching circuit for luminous display tubes. 3,656,142, Cl. 340-324.

Taylor, Harold M.: *See—*
Krumkalns, Eriks V.; and Taylor, Harold M.,3,655,359.

Taylor, John R. Fishing rod mount. 3,655,155, Cl. 248-38.000

Taylor, Louis Dale. Apparatus for transporting heavy objects. 3,655,218, Cl. 280-179.

Taylor, Lowell M. Teaching aid. 3,654,711, Cl. 35-66.

Taylor, Otis C., to Dow Chemical Company, The. Drying chlorine. 3,655,342, Cl. 23-219.

Taylor, Richard P., to Mead Corporation, The. Fabrication of orifices. 3,655,530, Cl. 204-26.

Taylor, Robert E.: *See—*
Layman, Harry D.; and Taylor, Robert E.,3,655,576.

Taylor, William W.; and Spencer, Richard O. Phonograph record vacuum cleaner. 3,654,660, Cl. 15-308.000

TDK Electronics Company, Ltd.: *See—*
Ezaki, Joichiro, 3,656,129.

Teboul, Albert, to Commissariat a l'Energie Atomique. Device for feeding powdered material. 3,654,970, Cl. 141-284.

Technicon Instruments Corporation: *See—*
Kassel, Aaron, 3,654,959.
Lieberman, Lee M.; and Schumann, Robert T., 3,655,288.

Tedeschi, Robert J.; and Natali, Paul W., to Air Products and Chemicals, Inc., mesne. Corrosion inhibitor mixture. 3,655,571, Cl. 252-148.

Tektronix, Inc.: *See—*
Bresee, Heber J.; and Bowman, James L., 3,656,031.

Teledyne, Inc.: *See—*
Wood, Arthur Eastman; Marvin, Ralph Edward; and Bates, Ralston Everett, 3,656,073.

Teletype Corporation: *See—*
Olsen, Alf J., 3,655,145.
Pack, Howard S., 3,656,181.
Stanevich, Anthony, 3,655,023.

Tenneco Chemicals, Inc.: *See—*
Forrest, Norman, 3,655,497.
Hoch, Samuel, 3,655,703.

Tenneco Inc.: *See—*
DuBois, Bert, 3,655,010.
Hubbell, Franklin R., III, 3,654,764.
Willett, Earl G., 3,655,011.

Teradyne Applied Systems, Inc.: *See—*
Richman, Peter, 3,656,053.

Terrell, William H., to Diebold, Incorporated. Pneumatic system carrier construction. 3,655,153, Cl. 243-35.

Tesch, Guenther Horst. Flexible materials. 3,655,501, Cl. 161-109.

Tesdahl, Thomas C.: *See—*
Crotty, Homer E.; Coffey, Charles R.; and Tesdahl, Thomas C.,3,655,579.

Texaco Inc.: *See—*
Harnsberger, Bobby G.; and Payton, Joy T., 3,654,990.
Harnsberger, Bobby G.; and Payton, Joy T., 3,654,991.
Harnsberger, Bobby G.; and Payton, Joy T., 3,654,992.
McMahon, Matthew A., 3,655,769.
Pogonowski, Ivo C.; and Carmichael, Paul D., 3,654,951.

Texas Gulf Sulphur Company: *See—*
Renken, Howard C.; and Zegers, Theodoor W., 3,655,538.

Texas Instruments, Incorporated: *See—*
Bloom, John A.; Spruill, Durward L.; and Wakefield, Gene F., 3,654,895.
Del Gaudio, Italo, 3,654,695.
Vezza, Hamlet D., 3,654,798.

Textron Inc.: *See—*
Hutzler, George J.; and Farah, Basil S., 3,655,627.
Thaeler, Bruce K., 3,654,673.

Thaeler, Bruce K., to Textron Inc. Fastening device for garments. 3,654,673, Cl. 24-208.

Thalmann, Armin: *See—*
Meier, Walter; Burkhardt, Max; and Thalmann, Armin,3,654,989.

Thatcher, Robert H., to Marine Systems, Inc. Pump. 3,655,294, Cl. 415-68.

Thermasol, Ltd.: *See—*
Altman, Murray; Altman, David; and Altman, Seymour E., 3,655,135.

Theurer, Josef: *See—*
Plasser, Franz; and Theurer, Josef,3,654,868.

Thiokol Chemical Corporation: *See—*
Dawbarn, Henry D., 3,654,884.
McCullough, Edward E., 3,655,148.

Thomas & Betts Corporation: *See—*
Cole, John M., 3,654,697.

Thomas, Bryan: *See—*
Bush, Richard P.; and Thomas, Bryan,3,655,615.
Bush, Richard Paul; and Thomas, Bryan,3,655,711.

Thomas, Daniel C., to Lithoplate, Inc. Polyurethane-cinnamate photopolymer. 3,655,625, Cl. 260-77.5

Thomas, Robert M.; and Gerns, Fred R., to Great Lakes Chemical Corporation. Phosgene as a novel catalyst for the abnormal addition of HBr to alpha-olefins. 3,655,788, Cl. 260-663.

Thomas, Roy D.: *See—*
Chen, Chung-Ho; and Thomas, Roy D.,3,656,003.

Thompson, Charles R.: *See—*
Allen, Robert E.; Thompson, Charles R.; and Hidalgo, John,3,655,680.

Thompson, Donald L.: *See—*
Schoendorfer, George F.; Morschhauser, Roger J.; Gardner, Thomas S.; and Thompson, Donald L.,3,655,539.

Thompson, Glenn S., to Koehring Company. Piston and rod assembly. 3,654,839, Cl. 92-200.

Thompson, Roy G., to Sale-Niagara, Inc. Ticket envelope. 3,655,119, Cl. 229-72.

Thum, Walter: *See—*
Span, Samuel; and Thum, Walter,3,654,727.

Thumberger, Harold C. Apparatus for manufacturing rotogravure printing roll. 3,655,286, Cl. 355-85.

Tichenor, Robert L., to Du Pont de Nemours, E. I., and Company. Synthetic organic textile fiber with improved, durable, soft, lubricated feel. 3,655,420, Cl. 117-138.8

Tissier, Pierre, to Compagnie de Saint-Gobain. Method and apparatus for the production of sheet glass. 3,655,355, Cl. 65-83.

Toa Gosei Chemical Industry Co., Ltd.: *See—*
Takeshima, Akio; Ueyama, Tadashi; Ohki, Akinori; and Mori, Tetsuo, 3,655,470.

Tokos, George M.: *See—*
Stanley, Hugh E.; and Tokos, George M.,3,655,503.

Tokusa, Yasunori: *See—*
Shiraishi, Tetsuya; Utsugi, Jun; Tanaka, Koji; and Tokusa, Yasunori,3,655,746.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Inagaki, Junpei; and Marumo, Hitoshi, 3,656,017.

Tolbert, Tommy L.: *See—*
Andersen, Harry M.; Morris, David C.; and Tolbert, Tommy L.,3,655,863.

Tomezsko, Edward S.: *See—*
Mitchell, Maurice M., Jr.; Fisher, Harold M.; and Tomezsko, Edward S.,3,655,792.
Mitchell, Maurice M., Jr.; Fisher, Harold M.; and Tomezsko, Edward S.,3,655,800.

Tomoda, Katsumi: *See—*
Isono, Masao; Tomoda, Katsumi; Miyata, Kouichi; Maejima, Kazutaka; and Tsubaki, Keisuke,3,655,570.
Toms River Chemical Corporation: *See—*
Lohmann, Karl Heinz, 3,655,637.
Tomsic, Raymond F., to Spectrum Infrared, Inc. Oven with closure mechanism. 3,655,942, Cl. 219-405.
Topp Ltd., Incorporated: *See—*
Toppel, Lewis R., 3,655,325.
Toppel, Lewis R., to Topp Ltd., Incorporated. Smoking deterrent. 3,655,325, Cl. 274-14.
Toray Industries, Inc.: *See—*
Tamai, Isamu; Oyama, Minoru; Osakada, Atsushi; and Shinohara, Yasuo, 3,655,542.
Yasuhara, Yutaka; Nogi, Tatsuo; and Takahashi, Ikuzo, 3,655,744.
Torres, Ruben Javier. Undergarment for men. 3,654,634, Cl. 2-224.00a
Torrington Manufacturing Company, The: *See—*
Cavagnero, Erman V.; and Loftus, Joseph F., 3,654,693.
Touchman, William S., to National Cash Register Company, The. Intermittent motion device for high-speed rotating print drums. 3,654,859, Cl. 101-93.
Tower, Horace L., to General Foods Corporation. Universal closure. 3,655,089, Cl. 220-42.
Trattner, Herman; and Leibhard, Erich, to Siemens Aktiengesellschaft. Apparatus for coating copper wires. 3,654,897, Cl. 118-69.
Trautner, Ferdinand A., to Viropac, Inc. Method of vibrating core in concrete pipe making machine. 3,655,842, Cl. 264-72.
Treille, Pierre: *See—*
Bouchard, Jean; Frison, Roger; and Treille, Pierre,3,655,587.
Trenner, Lew, to Cryotan, Inc. Receptacles for the storage of liquefied gases at cryogenic temperatures. 3,655,086, Cl. 220-9.
Treves, Gino R., to FMC Corporation. Process of preparing 5-benzyl-3-furanmethanol and intermediates therefor. 3,655,655, Cl. 260-240.
Trina, Inc.: *See—*
Zompa, Thomas A., 3,655,485.
Trout, Kenneth G.: *See—*
Medica, Joseph J.; Trout, Kenneth G.; and Kyminas, Stanley C.,3,655,594.
Trussell, Harry B., to Fermionics, Inc. Municipal waste disposal. 3,655,046, Cl. 210-11.
TRW Inc.: *See—*
Elliott, Robert L., 3,654,840.
Trzaska, Theodore T., to National Cash Register Company, The. Electrostatic device with controllable acceleration. 3,655,019, Cl. 192-48.9
Tsmesavers Sanders, Inc.: *See—*
Sternal, Lambert S., 3,654,738.
Tsubaki, Keisuke: *See—*
Isono, Masao; Tomoda, Katsumi; Miyata, Kouichi; Maejima, Kazutaka; and Tsubaki, Keisuke,3,655,570.
Tsubota, Yoshiharu: *See—*
Takamatsu, Yasuto; Ishii, Toshio; Hayami, Toshio; and Tsubota, Yoshiharu,3,655,887.
Tsubouchi, Kaoru, to Aisin Seiki Kabushiki Kaisha. Sealed reservoir for hydraulic brake systems. 3,654,956, Cl. 137-558.
Tsuchihashi, Takashi: *See—*
Sando, Yoshikazu; Tsuchihashi, Takashi; and Ishidoshiro, Hiroshi,3,655,328.
Tsuji, Nobuo: *See—*
Yasuda, Yukio; Tsuji, Nobuo; and Miyazako, Takushi,3,655,389.
Tsuji, Toshiro: *See—*
Akashi, Tsuneo; Sugano, Izuru; Okuda, Taneaki; Onodo, Yoshihiro; and Tsuji, Toshiro,3,655,841.
Tsutsumi, Mitsutoshi, to Kuraray Co., Ltd. Method of recovering palladium. 3,655,363, Cl. 75-101.
Tu, George K.: *See—*
Bryant, Richard W.; and Tu, George K.,3,656,118.
Tulagin, Vsevolod: *See—*
Carreira, Leonard M.; and Tulagin, Vsevolod,3,655,370.
Tumbiolo, Barney. Security bar lock assembly. 3,655,229, Cl. 292-148.
Tump, Dirk: *See—*
Rigney, William R.; Luciano, Robert A.; and Tump, Dirk,3,654,890.
Turnbull, Merlin Y., to Square D Company. Movable contact structure for an electric switch. 3,655,934, Cl. 200-166.
Turner, Charles L.; and Zerfahs, Arthur S., to Addressograph Multigraph Corporation. High speed photoelectrostatic copying machine. 3,655,282, Cl. 355-3.
Turner, David, to Turner, Dorothy R., and Brewer, Cecil G. Produce crate with ventilating apertured sections. 3,655,114, Cl. 229-30.
Turner, Dorothy R.: *See—*
Turner, David, 3,655,114.
Turner, Frank A., to Publishers Paper Co. Paper roll shaft with expandable collar. 3,655,144, Cl. 242-68.
Turner, John W., Jr.: *See—*
Langowski, Faustyn C.; and Turner, John W., Jr.,3,655,071.
Turowski, Johannes: *See—*
Buffleb, Herbert; Franck, Heinz Gerhard; Oberkobusch, Rudolf; Turowski, Johannes; Collin, Gerd; and Zander, Maximilian,3,655,802.
Twist, Douglas, to Pilkington Brothers Limited. Tongs for suspending glass sheets. 3,655,233, Cl. 294-118.
Tynan, Edward J.: *See—*
Sciavolino, Frank C.; Routien, John B.; Tynan, Edward J.; and Celmer, Walter D.,3,655,876.
Uchida, Shinzi; Nishizawa, Hiroshi; and Sone, Yasuo, to Hitachi Chemical Company, Ltd.Novel copolymers of α-amino acid-N-carboxylic anhydride with organic isocyanates and process for preparing the same. 3,655,628, Cl. 260-77.5
Uchino, Masahiro: *See—*
Chauvin, Yves; Lefebvre, Gilles; and Uchino, Masahiro,3,655,810.
Udden, Per Edward Carl: *See—*
Nilsson, Marit Gunnel Matilda; Udden, Ruth Gunvor Anna Britt; Udden, Per Edward Carl; and Wennerblom, Bengt Axel,3,654,929.
Udden, Ruth Gunvor Anna Britt: *See—*
Nilsson, Marit Gunnel Matilda; Udden, Ruth Gunvor Anna Britt; Udden, Per Edward Carl; and Wennerblom, Bengt Axel,3,654,929.
Ueda, Hiroshi; and Matsuda, Motonobu, to Minolta Camera Kabushiki Kaisha. Automatic flash camera. 3,654,843, Cl. 95-10.
Ueda, Terumori; and Imai, Tunemichi, to Agency of Industrial Science & Technology. Liquid pressure bulge forming apparatus. 3,654,785, Cl. 72-28.
Ueki, Atsufumi: *See—*
Miyauchi, Tsuneshige; Hirano, Jiro; Ueki, Atsufumi; Tatsumi, Ryuji; Mukai, Kunihiro; and Yoshikawa, Shogon,3,655,259.
Ueyama, Tadashi: *See—*
Takeshima, Akio; Ueyama, Tadashi; Ohki, Akinori; and Mori, Tetsuo,3,655,470.
Ueyanagi, Jisaburo: *See—*
Nakazawa, Koiti; Shibata, Motoo; Higashide, Eiji; Kanzaki, Toshihiko; Yamamoto, Hiroichi; Miyake, Akira; Ueyanagi, Jisaburo; and Iwasaki, Hidesuke,3,655,879.
Uhrden, Inc.: *See—*
Cook, Kenneth L.; and Mc Cartney, Thomas R., 3,654,854.
Ullmann, Werner; Tadini, Costantino; and Salim, Ehsan, to A.G. fur Industrielle Elektronic AGIE Losone Bei Locarno. Arrangement of at least two non-storage pulse generators for electro-erosion machining. 3,655,937, Cl. 219-69.
Ulrich, Paul; and Frey, Christoph, to Ciba Geigy AG. Azo dyestuffs containing triazines and vattable polycyclic quinones. 3,655,638, Cl. 260-153.
UMC Electronics Company: *See—*
Lince, William G., 3,656,113.
Umezawa, Hamao; Maeda, Kenji; Takeuchi, Tomio; Nitta, Kazuo; Okami, Yoshiro; and Ogawara, Hiroshi. Piurallin and production thereof. 3,655,877, Cl. 424-117.
Unangst, Raymond R.: *See—*
Grass, George M., Jr.; and Unangst, Raymond R.,3,655,864.
Underwater Storage, Inc.: *See—*
Quase, Harold Gerson, 3,655,051.
Union Carbide Corporation: *See—*
Keig, George A.; Smith, James C.; and Watts, John M. J., 3,655,415.
Louzos, Demetrios V.; and Mellors, Geoffrey W., 3,655,453.
McGrath, James E.; and Matzner, Markus, 3,655,822.
Quandt, Herbert C., 3,655,354.
Union Oil Company of California: *See—*
Fenton, Donald M., 3,655,745.
Fenton, Donald M., 3,655,763.
Hass, Robert H.; Helfrey, Paul F.; and Kay, Nicholas L., 3,655,551.
Union Special Machine Company: *See—*
Reimer, George M.; and Klose, Frederick M., 3,654,883.
Union Tank Car Company: *See—*
Brown, Fred, 3,656,134.
Uniroyal Englebert France S.A.: *See—*
Leblond, Jean; Biet, Jean; and Danneels, Guy, 3,654,828.
Uniroyal, Inc.: *See—*
Atwell, William J.; and Cranston, Lawrence, 3,654,967.
United Aircraft Corporation: *See—*
Greaves, Wellington N., 3,655,430.
Maxwell, Douglas H., 3,655,462.
Russell, Cornelius R.; and Russell, Sid, 3,655,537.
Setzer, Herbert J., 3,655,448.
United Kingdom Atomic Energy Authority: *See—*
Hardy, Clarence James; Lane, Edward Sydney; and Hannam, Mervyn John, 3,655,418.
Jilbert, Philip Harvey, 3,656,055.
United Shoe Machinery Company AB: *See—*
Forsgren, Kiell Rudolf, 3,655,213.
United States of America
Agriculture: *See—*
Connick, William J., Jr.; and Ellzey, Samuel E., Jr., 3,655,435.
Ellzey, Samuel E., Jr.; Connick, William J., Jr.; Reeves, Wilson A.; and Drake, George L., Jr., 3,655,413.
Air Force: *See—*
Jauvtis, Harvey I., 3,656,126.
Army: *See—*
Dalzell, Eugene W., Jr., 3,656,056.
Gilson, Russell A.; Kiss, William F.; and Organic, Vincent J.,

3,656,002.
Klayman, Daniel L.; and Gilmore, W. Franklin, 3,655,715.
Atomic Energy Commission: *See—*
Aaland, Kristian, 3,656,128.
Brak, Stephen B.; Steves, Clarence; and Mayfield, Ross M., 3,654,794.
Dixon, Norman E., 3,656,012.
Jansen, James M., Jr., 3,656,116.
Vollmer, Donald W., 3,656,063.
Health, Education and Welfare: *See—*
Judson, George T.; and Freireich, Emil J., 3,655,123.
Salyer, Ival O.; and Blardinelli, Albert J., 3,655,815.
Interior: *See—*
Hauf, Adolf W., 3,656,048.
Navy: *See—*
Bailey, Roddie F., 3,654,888.
Cavey, Richard R., 3,656,095.
Monaghan, Stephen R.; and Birch, James D., 3,656,070.
O'Daniel, Stephen A.; Mott, Murray H.; and Jones, Robert W., 3,655,997.
Roeschlein, Eugene R.; Weiss, Donald C.; and Zeph, David L., 3,656,096.
Wall, Leo A.; and Antonucci, Joseph M., 3,655,785.
United States Steel Corporation: *See—*
Brickner, Kenneth G.; and Ratz, George A., 3,655,459.
Kolobielski, Marjan, 3,655,626.
Universal Oil Products Company: *See—*
De Young, Edwin L., 3,655,791.
Schmerling, Louis, 3,655,797.
University of Edinburgh, The: *See—*
Neilson, James McEwan McIntyre, 3,654,916.
University of Michigan, The Regents of the: *See—*
Roon, Robert J.; and Levenberg, Bruce, 3,655,516.
Upjohn Company, The: *See—*
Hester, Jackson B., Jr., 3,655,647.
Morozowich, Walter; and Sinkula, Anthony A., 3,655,885.
Porter, Lawrence Christie, 3,655,311.
Urbach, John C., to Xerox Corporation. Apparatus for forming a phase hologram on a deformable thermoplastic. 3,655,257, Cl. 350-3.5
Urvantsev, Leonid Mikhailovich: *See—*
Artamonova, Nadezhda Ivanovna; Bushin, Leonid Mikhailovich; Besedin, Leonid Nikolaevich; Zhurenko, Anna Timofeevna; Urvantsev, Leonid Mikhailovich; Scherbakov, Jury Dmitrievich; Yasjukevich, Boris Ivanovich; Demin, Anatoly Anisimovich; and Peshkov, Evgeny Viktorovich,3,654,756.
U.S. Philips Corporation: *See—*
Dijkstra, Rinse; and Van Diepen, Cornelis Bernardus, 3,655,543.
Huyben, Bernardus Johannes Maria; Van Barneveld, Evert Jan; and Van De Steen, Louwrens Marinus, 3,656,010.
Utley, Ronald W., to Bethlehem Steel Corporation. Coal pellet and a method of manufacturing same. 3,655,350, Cl. 44-10.
Utsugi, Jun: *See—*
Shiraishi, Tetsuya; Utsugi, Jun; Tanaka, Koji; and Tokusa, Yasunori,3,655,746.
Vach, Miroslav, to Elitex, Zavody textilniho strojirenstvi. Electroimpulsive decimal counter. 3,655,951, Cl. 235-92.
Vagenius, Harold N., to Vagenius, Helen M., administrator with the will annexed of the estate of said Vagenius, Harold N., deceased. Oral deodorant. 3,655,868, Cl. 424-54.
Vagenius, Helen M.: *See—*
Vagenius, Harold N., 3,655,868.
Valadez, Carlos. Illusion display apparatus. 3,655,272, Cl. 350-235.
Valbusa, Luigi: *See—*
Merli, Paoli; and Valbusa, Luigi,3,655,391.
Van Barneveld, Evert Jan: *See—*
Huyben, Bernardus Johannes Maria; Van Barneveld, Evert Jan; and Van De Steen, Louwrens Marinus,3,656,010.
Van Bergen, Johannes Antonius Wilhelmus Petrus. Ear-ornament clips. 3,654,774, Cl. 63-14.
Van De Steen, Louwrens Marinus: *See—*
Huyben, Bernardus Johannes Maria; Van Barneveld, Evert Jan; and Van De Steen, Louwrens Marinus,3,656,010.
Van Den Elzen, Norbert L.: *See—*
Goldbeck, Leroy J.; and Van Den Elzen, Norbert L.,3,655,422.
Vandenberg, Edwin J., to Hercules Incorporated. Copolymers of cyclic phosphates and epoxides or aldehydes. 3,655,586, Cl. 260-2.
Van Der Grinten N.V.: *See—*
Breuers, Theo Pierre Cretien, 3,655,287.
Van Der Lely, Cornelis. Mowing machines. 3,654,750, Cl. 56-16.2
Vander Mey, John E.: *See—*
Page, Walter; Schevey, William R.; and Vander Mey, John E.,3,655,533.
Van Diepen, Cornelis Bernardus: *See—*
Dijkstra, Rinse; and Van Diepen, Cornelis Bernardus,3,655,543.
Van Egdom, Richard; and Schotten, Alfons. Band filter press. 3,655,055, Cl. 210-225.
Van Hell, Hans. Process for the purification of crude gonadotropin preparations. 3,655,874, Cl. 424-99.
Van Heyningen, Earle M., to Lilly, Eli, and Company. Crystalline cephalexin monohydrate. 3,655,656, Cl. 260-243.
Vanin, Vladimir Lvovich: *See—*
Polyakov, Georgy Filippovich; Vanin, Vladimir Lvovich; and Kamardin, Vladimir Alexandrovich,3,655,209.
Van Lare, Earl J.; and Fumia, Arthur, Jr., to Eastman Kodak Company. Photographic emulsion containing tertiary amino alkyl substituted rhodanine and thiobarbituric acid merocyanine dye. 3,655,393, Cl. 96-140.
Van Slooten, Nico J., to Beckman Instruments, Inc. Mechanical positioning device for precisely determining a series of mechanical locations. 3,655,020, Cl. 192-142.
Van Stelten, Henry. Process for heating rubber surfaces. 3,655,434, Cl. 117-139.
Varian Mat GmbH: *See—*
Brunnee, Kurt; and Kramer, Feodor Otto, 3,655,963.
Vasta, Joseph A., to Du Pont de Nemours, E. I., and Company. Fluoropolymer coating compositions. 3,655,610, Cl. 260-39.
Vatkin, Adolf Semenovich. *See—*
Portyanko, Andrei Ivanovich; Lastovenko, Valentin Andreevich; Dudka, Viktor Vasilievich; Rodenko, Fedor Leontievich; Onischenko, Grigory Ivanovich; Vatkin, Adolf Semenovich; Pokusa, Alexei Alexandrovich; and Ruzin, Ivan Mikhailovich,3,654,997.
Vaughan & Bushnell Mfg. Co.: *See—*
Wolf, Wayne, 3,655,321.
Vaughan, Woodrow E.: *See—*
Scoggin, Baxter I., Jr.; Vaughan, Woodrow E.; and Reed, Gerald D.,3,654,754.
Vazquez, Eugenio A.; and Barcia, Manuel. Oil can opener drip collector. 3,654,969, Cl. 141-106.
Veb Druckmaschinenwerk Planeta: *See—*
Rudolph, Otfried; and Kuhn, Wilfried, 3,654,861.
Veith, Werner, to Dravo Corporation. Air sealing device for the traveling grates of sintering machines. 3,655,174, Cl. 266-21.
Velsicol Chemical Corporation: *See—*
Krenzer, John; and Richter, Sidney B., 3,655,751.
Richter, Sidney B.; and Mayer, David P., 3,655,731.
Richter, Sidney B.; and Mayer, David P., 3,655,734.
Vernitron Corporation: *See—*
Schweitzer, Earl O., 3,655,324.
Vey, John E.: *See—*
Karas, Albert J.; and Vey, John E.,3,655,405.
Vezina, Jean A., to Les Entreprises Vezina, Jean A., Ltee. Pedriatric device for immobilizing a patient child. 3,655,178, Cl. 269-323.
Vezza, Hamlet D., to Texas Instruments, Incorporated. Apparatus for making a snap acting thermostatic element. 3,654,798, Cl. 72-412.
Vickers Limited: *See—*
Hinds, David, 3,655,987.
Victor Company of Japan, Limited: *See—*
Wada, Yoshiyo; and Yasutake, Katsuya, 3,655,910.
Victronic, Inc.: *See—*
Schwartz, Joseph E., 3,654,847.
Vidal, Frederick D., to Pennwalt Corporation. Treatment of flour and dough. 3,655,403, Cl. 99-91.
Viersma, Taco Jan: *See—*
Blok, Petrus; and Viersma, Taco Jan,3,654,918.
Vik, Albam M., to Inventors Engineering Inc. Pallet for handling shipping drums. 3,654,875, Cl. 108-51.
Vinson, Leonard J.; and Masurat, Thomas, to Lever Brothers Company. Lipid-protein membrane and process. 3,655,416, Cl. 106-155.
Viropac, Inc.: *See—*
Trautner, Ferdinand A., 3,655,842.
Vitta Corporation: *See—*
Ettre, Kitty S.; and Castles, George Richard, 3,655,496.
Vivani, Artemio: *See—*
Grilli, Umberto; Sturba, Bruno; and Vivani, Artemio,3,654,831.
Voge, Andrew: *See—*
Lincoln, Thomas C.; and Voge, Andrew,3,655,925.
Vogel, Carl-Heinz: *See—*
Longo, Hans-Eberhard; Keller, Wolfgang; and Vogel, Carl-Heinz,3,655,345.
Vogt, Wilhelm: *See—*
Sennewald, Kurt; Vogt, Wilhelm; Erpenbach, Heinz; and Glaser, Hermann,3,655,747.
Volker, William. Stylus for wax writing, gold scrolling and the like. 3,655,291, Cl. 401-265.
Volkswagenwerk Aktiengesellschaft: *See—*
Duren, Rainer; and Neidig, Klaus, 3,656,098.
Vollmer, Donald W., to United States of America, Atomic Energy Commission. Digital frequency comparator. 3,656,063, Cl. 328-133.
Von Kaenel, Fred: *See—*
Meindl, Hubert; Ackermann, Hans; and Von Kaenel, Fred,3,655,665.
Vortec Corporation: *See—*
Inglis, Leslie R.; and Peter, Joseph E., 3,654,768.
Vosika, Eugene A.: *See—*
Baker, Alexander; and Vosika, Eugene A.,3,655,041.
Vulcan, Inc.: *See—*
Skinner, Harvey G., 3,654,874.
Wada, Yoshiyo; and Yasutake, Katsuya, to Victor Company of Japan, Limited. Magnetic recording, reproducing, and editing apparatus. 3,655,910, Cl. 178-6.6
Wagner, John W., to Xerox Corporation. Sheet feed apparatus. 3,655,183, Cl. 271-62.
Wagner, Richard C.: *See—*
Rohrbacher, James T.; and Wagner, Richard C.,3,654,894.
Wajaroff, Theodor, to Wella Aktiengesellschaft. Process for straightening human hair. 3,654,936, Cl. 132-7.
Wakefield, Gene F.: *See—*

Bloom, John A.; Spruill, Durward L.; and Wakefield, Gene F.,3,654,895.
Wakeman, William R., to Moore Business Forms, Inc. Manifold forms. 3,655,222, Cl. 282-11.5
Waksman, David, to Certain-Teed Saint Gobain Insulation Corporation. Jacketed fibrous duct. 3,654,966, Cl. 138-141.
Waldvogel, Guy: *See—*
Furst, Andor; Furlenmeiter, Andre; Langemann, Albert; Waldvogel, Guy; Hocks, Peter; Kerb, Ulrich; and Wiechert, Rudolf,3,655,650.
Walford, Gordon L.: *See—*
Shen, Tsung-Ying; and Walford, Gordon L.,3,655,692.
Shen, Tsung-Ying; Ruyle, William V.; Walford, Gordon L.; and Witzel, Bruce E.,3,655,679.
Shen, Tsung-Ying; Witzel, Bruce E.; and Walford, Gordon L.,3,655,693.
Shen, Tsung-Ying; Witzel, Bruce E.; Walford, Gordon L.; and Ruyle, William V.,3,655,697.
Walker, James V., to McDonnell Douglas Corporation. Split piston ring and method of manufacture. 3,655,208, Cl. 277-221.
Walker, Jimmy Aubrey, to Susquehanna Corporation, The. Opacity meter with noise suppression. 3,655,289, Cl. 356-201.
Wall, Alfred J.: *See—*
Hall, Roger L.; McKenney, Gordon M., Jr.; and Wall, Alfred J.,3,655,192.
Wall, Leo A.; and Antonucci, Joseph M., to United States of America, Navy. Method of making perfluorostyrene. 3,655,785, Cl. 260-651.
Wallace, George O., to Diversified Industries Inc., mesne. Dampened railway truck. 3,654,870, Cl. 105-197.
Wallace, George O., to Schullin Steel Company. Dampened railway truck. 3,654,871, Cl. 105-197.
Wallace, Richard R.: *See—*
Bowen, Howard; Henderson, David L.; and Wallace, Richard R.,3,655,945.
Wallis, Robert L., to Downingtown Division Beloit Corporation. Turret mounted flying splice unwind. 3,655,143, Cl. 242-58.3
Walsh, James L.: *See—*
Maley, Gerald A.; and Walsh, James L.,3,656,117.
Walter, Armin: *See—*
Rossi, Alberto; Walter, Armin; Kessler, Werner; and Iselin, Beat,3,655,884.
Walter, Carlton H.; Rudduck, Roger C.; Ryan, Charles E., Jr.; Walter, Carlton H.; Rudduck, Roger C.; Ryan, Charles E., Jr.; Walter, Carlton H.; Rudduck, Roger C.; and Ryan, Charles E., Jr., to Ohio State University, The Ohio State University, The. Lens polarization control Lens polarization control. 3,656,165, Cl. 343-754.
Walter, John L.; Cline, Harvey E.; and Cobine, James D., to General Electric Company. Vacuum switch contacts. 3,655,368, Cl. 75-170.
Walterscheid, Ted B., to ACS Industries, Inc. Connector assembly. 3,656,183, Cl. 339-17.
Wang, Chun-Shan; and Easterly, James P., to Dow Chemical Company, The. Substituted-2-(1H)pyridones. 3,655,678, Cl. 260-295.
Wang, Tsu-Huai: *See—*
Healy, Lawrence W.; Wang, Wu Lan; and Wang, Tsu-Huai,3,655,471.
Wang, Wu Lan: *See—*
Healy, Lawrence W.; Wang, Wu Lan; and Wang, Tsu-Huai,3,655,471.
Ward, Alice E. M. Combination return address and receipt indicating answer card. 3,655,121, Cl. 229-92.8
Ward, George W.: *See—*
Shah, Dipak Co.; Ward, George W.; and Whiteley, Roger L.,3,655,349.
Ward, John V.: *See—*
Fernald, Herbert B.; Gall, William; Gwynn, Bernard H.; and Ward, John V.,3,655,809.
Warner & Swasey Company, The: *See—*
Stein, William B., 3,654,681.
Warner, Richard E. Adjustable trailer hitch. 3,655,221, Cl. 280-490.
Warner-Lambert Company: *See—*
Bilotti, Anthony G., 3,655,866.
Kroc, Robert L.; and Mischler, Terrence W., 3,655,889.
Shih, I-Kao; and Blaser, Eric, 3,655,329.
Warren, Larry H., to Xerox Corporation. Billing apparatus. 3,655,281, Cl. 355-3.
Warthen, William P., to Deering Milliken Research Corporation. Bobbin adaptor. 3,655,141, Cl. 242-46.4
Wasleski, Daniel M.: *See—*
Gier, Delta W.; and Wasleski, Daniel M.,3,655,893.
Wasson, Burton K., to Frosst, Charles E., and Co. Benzothiadiazole compounds. 3,655,661, Cl. 260-247.1
Wasson, Burton K. 4-(3-Secondary amino-2-hydroxy-proxy) 1,2,5-thiadiazoles. 3,655,663, Cl. 260-247.1
Watanabe, Jun: *See—*
Yamamoto, Shohei; Watanabe, Jun; Hosoi, Susumu; Kuwazaki, Masahiro; Ota, Akira; Takata, Toshikatsu; and Asaoka, Junichi,3,655,449.
Watanabe, Tadashi: *See—*
Kozu, Haruo; Kimura, Morio; Watanabe, Tadashi; Naozumi, Hiratsuka; and Yoshida, Michio,3,655,596.
Watanabe, Yoshinori, to Honda Giken Kogyo Kabushiki Kaisha. Antiskid brake apparatus. 3,655,016, Cl. 188-181.
Watts, Carlos R. Vehicle stabilizer. 3,655,216, Cl. 280-150.
Watts, John M. J.: *See—*
Keig, George A.; Smith, James C.; and Watts, John M. J.,3,655,415.
Webb, John M.: *See—*
Mellen, Edward J., Jr.; Baker, Edmond M.; and Webb, John M.,3,654,984.
Webb, Joseph H.; and Stiles, Donald G. Conveyor apparatus. 3,655,029, Cl. 198-127.
Weber, Helmut; Weyer, Rudi; Aumuller, Walter; Muth, Karl; and Stach, Kurt, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Benzenesulfonyl ureas having hypoglycemic activity. 3,655,756, Cl. 260-553.
Webster, Becker, James H.: *See—*
Haas, Werner E. L.; Adams, James E.; Webster, Becker, James H.; Haas, Werner E. L.; Adams, James E.; Becker, James H.; Haas, Werner E. L.; Adams, James E.; Becker, James H.; Wysocki, Joseph J.; Haas, Werner E. L.; Adams, James E.; Becker, James H.; and Wysocki, Joseph J.,3,655,971.
Wechsler, Bernard; and Wechsler, Roger. Method for manufacturing electric fuses. 3,654,696, Cl. 29-623.
Wechsler, Roger: *See—*
Wechsler, Bernard; and Wechsler, Roger,3,654,696.
Weedon, Gene C.: *See—*
Winckllhofer, Robert C.; and Weedon, Gene C.,3,655,858.
Weg, Leo: *See—*
Friederichs, Josef E.; Friederichs, Edgar E.; and Weg, Leo,3,655,052.
Weigele, Manfred: *See—*
Liemgruber, Willy; and Weigele, Manfred,3,655,716.
Weil, Edward D., to Hooker Chemical Corporation. Polyvinyl halide thioether polymers. 3,655,618, Cl. 260-47.
Weinberg, Zeev Abraham, to RCA Corporation. Charge coupled device. 3,656,011, Cl. 307-304.
Weir, Edgar V.: *See—*
Helm, Herbert W.; and Weir, Edgar V.,3,656,036.
Weiss, Arthur J., to Continental Can Company, Inc. Latching means for cartons. 3,655,117, Cl. 229-40.
Weiss, Donald C.: *See—*
Roeschlein, Eugene R.; Weiss, Donald C.; and Zeph, David L.,3,656,096.
Welch, William H.: *See—*
Ebergardt, Thomas; and Welch, William H.,3,655,083.
Wella Aktiengesellschaft: *See—*
Wajaroff, Theodor, 3,654,936.
Weller, Wilhelm, to Messrs. Transporttechnik GmbH. Conveyor for shopping carts. 3,655,013, Cl. 186-1.
Wells, Alton R. Thermostat or the like having twisted bimetal strip therein. 3,656,080, Cl. 337-111.
Wennerblom, Bengt Axel: *See—*
Nilsson, Marit Gunnel Matilda; Udden, Ruth Gunvor Anna Britt; Udden, Per Edward Carl; and Wennerblom, Bengt Axel,3,654,929.
Werkzeugmaschinenfabrik Oerlikon-Buhrle AG: *See—*
Keller, Siegfried, 3,655,246.
Werner, Fred C., Jr., to Engel Industries, Inc. Sheet metal blanking and shearing machine. 3,654,830, Cl. 83-208.
Werner, Georges, to Rhone-Poulenc S.A. Inactivation of influenza viruses with lower alkyl esters of acetic acid. 3,655,871, Cl. 424-89.
Wernikoff, Robert E.; Perozek, David M.; and Roten, Jana M., to Electronic Image Systems Corporation. Electro-mechanical shutter array. 3,654,846, Cl. 95-53.
West, Charles David, to Beckman Instruments, Inc. Apparatus for automatically performing the least squares approximation to the standard addition method of analysis. 3,655,958, Cl. 235-151.35
Western Electric Company, Incorporated: *See—*
Coucoulas, Alexander, 3,655,177.
Westinghouse Air Brake Company: *See—*
Donaldson, George W., 3,656,037.
Westinghouse Electric Corporation: *See—*
Circle, Robert Ray, 3,655,931.
DeKlerk, John, 3,655,429.
Hayden, John T., Jr.; and Plasewicz, Casimir F., 3,655,460.
Holtkamp, Calvin J., 3,655,943.
Westinghouse Learning Corporation: *See—*
Brudner, Harvey J., 3,654,708.
Weston Chemical Corporation: *See—*
Friedman, Lester, 3,655,831.
Weyer, Rudi: *See—*
Weber, Helmut; Weyer, Rudi; Aumuller, Walter; Muth, Karl; and Stach, Kurt,3,655,756.
Wharton, Ferdinand D.; Johnson, John H.; Fields, Joseph E.; and Machlin, Lawrence J., to Monsanto Company. Treatment od diarrhea employing certain basic polyelectrolyte polymers. 3,655,869, Cl. 424-78.
Wheeler, Robert Charles, to Sylvania Electric Products, Inc. Gamma correcting photoelectric transducer circuitry. 3,655,916, Cl. 178-5.4
Whirlpool Corporation: *See—*
Clearman, Jack F., 3,654,770.
Samuelson, Bruce E.; and Dunst, Robert A., 3,655,927.
White, Charles S. Method of constructing a ball type bearing. 3,654,683, Cl. 29-149.5
White, Frank F., to Automation Development Corporation. Bar feeder

and escapement device. 3,655,067, Cl. 214-1.
White, John D. Controlled temperature bait bucket. 3,654,773, Cl. 62-371.
White Motor Corporation: *See—*
Singer, Robert B.; Muir, Earl B.; and Kotzar, Andrew J., 3,654,822.
Whiteley, Roger L.: *See—*
Shah, Dipak Co.; Ward, George W.; and Whiteley, Roger L.,3,655,349.
Whitfill, Donald L.: *See—*
Rickard, Robert S.; and Whitfill, Donald L.,3,655,358.
Whitney, Joel G.: *See—*
Lee, Kyu Tai; and Whitney, Joel G.,3,655,694.
Wiechers, Herbert: *See—*
Fries, Ludwig; Mundil, Rudolf; and Wiechers, Herbert,3,655,709.
Wiechert, Rudolf: *See—*
Furst, Andor; Furlenmeiter, Andre; Langemann, Albert; Waldvogel, Guy; Hocks, Peter; Kerb, Ulrich; and Wiechert, Rudolf,3,655,650.
Lehmann, Hans-Gunter; Zollner, Georg; and Wiechert, Rudolf,3,655,643.
Wiedmann, Siegfried K., to International Business Machines Corporation. Shift register. 3,655,999, Cl. 307-221.
Wieme, Andre, to N.V. Bekaert S.A. Fluidic diode. 3,654,946, Cl. 137-81.5
Wienerberger Ziegelfabriks- und Baugesellschaft: *See—*
Kaitna, Walter, 3,655,322.
Wiggins, Charles S.: *See—*
Bolen, Hugh R., Jr.; and Wiggins, Charles S.,3,655,297.
Wild, Robert G., to Ladney, Michael, Jr. Fixtures for electrochemical processes. 3,655,549, Cl. 204-297.
Wildfeuer, Alexander: *See—*
Reuter, Wolfgang; Kutter, Eberhard; Sauter, Robert; Machleidt, Hans; and Wildfeuer, Alexander,3,655,685.
Wiley, Daniel E., to PPG Industries, Inc. Quenching vinyl chloride containing gas streams. 3,655,787, Cl. 260-656.
Wilhelm, Wilhelm, to Siemens Aktiengesellschaft. Logical gate switching circuit in ECL- switching circuit technique. 3,655,998, Cl. 307-215.
Wilhoit, Jerry W., to Glastron Boat Company. Windshield. 3,654,648, Cl. 9-1.
Wilkin, John P., to Armstrong Blum Manufacturing Company. Side ejector for band saw conveyor or the like. 3,655,025, Cl. 198-24.
Wilkinson, Leonard A., to American Optical Corporation. Ophthalmic refracting chart projector. 3,655,276, Cl. 351-30.
Willemsens, Louis C. Organolead nitrogen compounds. 3,655,683, Cl. 260-299.
Willett, Earl G., to Tenneco Inc. Sound attenuating chamber. 3,655,011, Cl. 181-48.
Willhaus, Werner; and Scharf, Friedrich, to Bosch, Robert, G.m.b.H. Container with pressure retaining sealing elements. 3,655,084, Cl. 215-37.
Willhite, Glen Paul; and Martin, William L., to Continental Oil Company. Process for constructing prestressed conduit for heated fluids. 3,654,691, Cl. 29-446.
Williams, Charles H., to Koppers Company, Inc. Disc type flexible shaft coupling. 3,654,775, Cl. 64-13.
Williams, Herschel C.: *See—*
Schultz, Henry G.; Williams, Herschel C.; Neureiter, Norman P.; and Bown, Delos E.,3,655,718.
Williams, John F., to Sorvall, Ivan, Inc. Variable and reversing hydraulic drive system for turbines. 3,655,293, Cl. 415-17.000
Williams, Lyle K.: *See—*
Faria, Sixdeniel; and Williams, Lyle K.,3,655,575.
Williams, William W., to Lockheed Aircraft Corporation. Flap actuating mechanism. 3,655,149, Cl. 244-42.
Willis, Grant N., to Russell, Arthur G., Company, Incorporated, The. Vibratory feeder. 3,655,032, Cl. 198-220.
Wilnau, John A. Concrete building component. 3,654,742, Cl. 52-744.
Wilson, Earl D.; and Ellmann, Norbert W., to Abbott Laboratories. Blood collection assembly. 3,654,924, Cl. 128-214.
Wilson, James Dennis: *See—*
Hobbs, Charles F.; and Wilson, James Dennis,3,655,690.
Wilson, Kenneth R. A.: *See—*
Bonn, Clifford; and Wilson, Kenneth R. A.,3,655,152.
Wilson, Kenneth R.; and Kennedy, Robert M., to FMC Corporation. 2,3-Dihydro-3,3-dimethyl-5-benzofuranyl methylcarbamate. 3,655,696, Cl. 260-346.2
Wilson Lighting Limited: *See—*
Shepherd, Charles G., 3,654,849.
Wilson, Ray I.: *See—*
Marovich, Frank A.; and Wilson, Ray I.,3,655,546.
Wiltz, Robert E.; Schreiner, Edmund D.; and Winsor, Malcolm C., to Athena Systems, Inc. Impression sensing. 3,656,172, Cl. 346-74.
Winckhofer, Robert C.; and Weedon, Gene C., to Allied Chemical Corporation. Process for shaping fabric articles. 3,655,858, Cl. 264-230.
Windholz, Thomas B.: *See—*
Jensen, Norman P.; Shen, Tsung-Ying; and Windholz, Thomas B.,3,655,901.
Windings, Inc.: *See—*
Gordon, William F.; and Newman, James W., 3,655,140.
Wingler, Frank; Dietrich, Werner; Bartl, Herbert; and Kraft, Karl-Josef, to Farbenfabriken Bayer Aktiengesellschaft. Flameproofed organic synthetic resins. 3,655,589, Cl. 260-2.5
Winker, Bernard L., to International Harvester Company. Power pitching bullgrader. 3,655,000, Cl. 172-804.
Winkler, Friedrich; and Zanner, Johann, to Agfa-Gevaert Aktiengesellschaft. Motion picture camera. 3,655,278, Cl. 352-74.
Winkler, Hans-Joachim; and Fehling, Hans Richard, to Stoecker & Kunz GmbH. Closure devices for metallurgical and like vessels. 3,655,176, Cl. 266-38.
Winnicki, Henry S.: *See—*
Seglin, Leonard; and Winnicki, Henry S.,3,655,331.
Winsor, Malcolm C.: *See—*
Wiltz, Robert E.; Schreiner, Edmund D.; and Winsor, Malcolm C.,3,656,172.
Winter, Gerhard: *See—*
Schindler, Herbert; and Winter, Gerhard,3,654,651.
Wintriss, George Victor, to Industrionics Controls, Inc. Malfunction detector. 3,656,139, Cl. 340-267.
Wire Sales Company: *See—*
Malme, Elmer K., 3,655,994.
Malme, Elmer K., 3,655,995.
Wirth, David Griffith, Jr.: *See—*
Rettew, Richard Raymond; Wirth, David Griffith, Jr.; and Levy, Newton, Jr.,3,655,330.
Wise, Layton A.: *See—*
Cotabish, Harry N.; Wise, Layton A.; and Buban, Elmer E.,3,655,346.
Wisseroth, Karl; and Scholl, Richard, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Lowering the molecular weight of high molecular weight polyethylene in the powder phase. 3,655,834, Cl. 260-94.9
Witte, Don C. Toy building set and disc-like units therefor. 3,654,726, Cl. 46-16.
Wittmoser, Adalbert; Schade, Johannes; and Krzyzanowski, Erich, to Full Mold Process, Inc., mesne. Gasifiable casting core. 3,654,987, Cl. 164-369.
Witzel, Bruce E., to Merck & Co., Inc. Antiinflammatory agents. 3,655,897, Cl. 424-203.
Witzel, Bruce E.: *See—*
Shen, Tsung-Ying; Ruyle, William V.; Walford, Gordon L.; and Witzel, Bruce E.,3,655,679.
Shen, Tsung-Ying; Witzel, Bruce E.; and Walford, Gordon L.,3,655,693.
Shen, Tsung-Ying; Witzel, Bruce E.; Walford, Gordon L.; and Ruyle, William V.,3,655,697.
Wlasuk, Steven, to RCA Corporation. Lightning protection system. 3,656,062, Cl. 325-362.
Wochnowski, Waldemar; and Friebel, Heinz, to Hauni-Werke Korber & Co. KG. Pneumatic tobacco classifying apparatus. 3,655,043, Cl. 209-138.
Wojcinski, Alfons Stefan. Gunbelt. 3,655,106, Cl. 224-1.
Wolf, Wayne, to Vaughan & Bushnell Mfg. Co. Apparatus for producing a hollow hammer handle with longitudinally tensioned glass fibers. 3,655,321, Cl. 425-395.
Wolff, Peter Adalbert, to Bell Telephone Laboratories, Incorporated. Optically-rotatory dielectric-guided parametric oscillators. 3,655,993, Cl. 307-88.3
Woll, Toni. Pneumatic dispatch systems. 3,655,146, Cl. 243-35.
Womack, Karl K.: *See—*
Carnevale, Richard J.; Howe, Leland D., Jr.; Metz, Thomas A.; Womack, Karl K.; and Zurla, Frank A.,3,656,123.
Wong, Soon Y.: *See—*
Boyer, Lyndon D.; Coldiron, Arnold L.; and Wong, Soon Y.,3,655,801.
Wood, Arthur Eastman; Marvin, Ralph Edward; and Bates, Ralston Everett, to Teledyne, Inc. Electrical relay with magnetic armature retention means. 3,656,073, Cl. 335-179.
Wood, Charles; Schottmiller, John C.; and Roy, Rustum, to Xerox Corporation. Electrophotographic denitrified glass binder plate. 3,655,376, Cl. 96-1.5
Wood, Henry Walter, to Ilford Limited. Anti-static coating for photographic emulsion layers. 3,655,384, Cl. 96-67.
Wood, Henry Walter, to Ilford Limited. Anti-static coatings for photographic materials. 3,655,386, Cl. 96-87.
Woodell, Rudolph, to Du Pont de Nemours, E. I., and Company. Plexifilamentary structures prepared from non- crystalline synthetic organic polymers. 3,655,498, Cl. 161-172.
Woodham, George W.; and Stuart, James L., to Dart Industries, Inc. Method for the continuous production of glass fiber reinforced thermoplastics. 3,655,850, Cl. 264-118.
Woodman, Frank H., Jr.: *See—*
Coopersmith, Leo; and Woodman, Frank H., Jr.,3,655,228.
Woodward, Oakley McDonald, to RCA Corporation. Wide band balun. 3,656,071, Cl. 333-26.
Worden, John R.; and Kratzke, Albert W., to Boeing Company, The. Temperature measurement technique and apparatus. 3,654,809, Cl. 73-355.00r
Worthington Corporation: *See—*
Bloom, Carl, 3,654,748.
Wowk, Anatole, to M & T Chemicals Inc. Stabilized halo-vinyl resin compositions. 3,655,613, Cl. 260-45.75
Wright, Homer W. Combined staple puller and wire stretcher. 3,655,165, Cl. 254-77.
Wright, Kenneth N.; and Shanklin, Samuel H., to Staley, A. E., Manufacturing Company. Stable dietary supplement for new born pigs.

3,655,882, Cl. 424-147.
Wyandotte Chemicals Corporation: *See—*
Strassel, Albert Pierre, 3,655,597.
Wyeth, John, & Brother Limited: *See—*
Archibald, John Leheup, 3,655,674.
Wygant, James C.; Anderson, Richard M.; and Prill, Erhard J., to Monsanto Company. 2,3-Dihaloalkyl compounds. 3,655,726, Cl. 260-468.
Wyman, John S., Jr.: *See—*
Keefer, Richard D.; and Wyman, John S., Jr.,3,654,801.
Wysocki, Joseph J.: *See—*
Haas, Werner E. L.; Adams, James E.; Webster, Becker, James H.; Haas, Werner E. L.; Adams, James E.; Becker, James H.; Haas, Werner E. L.; Adams, James E.; Becker, James H.; Wysocki, Joseph J.; Haas, Werner E. L.; Adams, James E.; Becker, James H.; and Wysocki, Joseph J.,3,655,971.
Xerox Corporation: *See—*
Abreu, Christian O.; Bernhard, John S.; and Chiavaroli, Henry T., 3,654,654.
Agliata, Thomas P., 3,655,284.
Carreira, Leonard M.; and Tulagin, Vsevolod, 3,655,370.
Davies, Terence J., 3,655,550.
Donohue, James M.; and Gerbasi, Dennis P., 3,654,901.
Fisher, Donald J.; and Severynse, Gerard T., 3,655,373.
Gundlach, Robert W., 3,655,379.
Haas, Werner E. L.; Adams, James E.; Webster, Becker, James H.; Haas, Werner E. L.; Adams, James E.; Becker, James H.; Haas, Werner E. L.; Adams, James E.; Becker, James H.; Wysocki, Joseph J.; Haas, Werner E. L.; Adams, James E.; Becker, James H.; and Wysocki, Joseph J., 3,655,971.
Krohn, Ivar T.; Page, Geoffrey A.; and Reinis, Gedeminas J., 3,655,372.
Lynch, Thomas; and Shah, Dineshchandra S., 3,655,033.
Madrid, Robert William, 3,655,375.
Palermiti, Frank M.; and Chatterji, Arun K., 3,655,374.
Sechak, Ronald P., 3,655,377.
Takimoto, Masaaki; Sato, Masamichi; and Honjo, Satoru, 3,655,966.
Urbach, John C., 3,655,257.
Wagner, John W., 3,655,183.
Warren, Larry H., 3,655,281.
Wood, Charles; Schottmiller, John C.; and Roy, Rustum, 3,655,376.
Yang, Frank Y., 3,654,900.
Zoppoth, Raymond C., 3,655,280.
Yamada, Kenji: *See—*
Aoyama, Ryozo; Koiwai, Akira; and Yamada, Kenji,3,654,758.
Ito, Mikiji; Yamada, Kenji; and Noda, Kazuo,3,654,763.
Yamaguchi, Terumoto: *See—*
Mase, Takehisa; Kawaura, Hirosi; Yamaguchi, Terumoto; and Amano, Yosinao,3,655,142.
Yamajima, Kaneo, to Kabushiki Kaisha. Weighing machine. 3,655,003, Cl. 177-173.
Yamamoto, Hajime: *See—*
Kano, Tsuyoshi; Otomo, Yoshiro; and Yamamoto, Hajime,3,655,577.
Yamamoto, Hiroichi: *See—*
Nakazawa, Koiti; Shibata, Motoo; Higashide, Eiji; Kanzaki, Toshihiko; Yamamoto, Hiroichi; Miyake, Akira; Ueyanagi, Jisaburo; and Iwasaki, Hidesuke,3,655,879.
Yamamoto, Keisaku; Takao, Hiroyoshi; Hirooka, Masaaki; and Oshima, Teruo, to Sumitomo Chemical Company, Limited. Vanadyl compound having cyclic hydrocarbon substituent and polymerization catalyst containing said compound. 3,655,583, Cl. 252-431.
Yamamoto, Mititaka; and Nagata, Masanori, to Omron Tateisi Electronics Co. Identification system. 3,655,947, Cl. 235-61.7
Yamamoto, Shigeo: *See—*
Kono, Reisaku; Yamamoto, Shigeo; and Yaoi, Hideaki,3,655,872.
Yamamoto, Shohei; Watanabe, Jun; Hosoi, Susumu; Kuwazaki, Masahiro; Ota, Akira; Takata, Toshikatsu; and Asaoka, Junichi, to Matsushita Electric Industrial Co., Ltd. Dry cell comprising a separator composed of three layers. 3,655,449, Cl. 136-107.
Yamamoto, Tokio: *See—*
Jingu, Tomoyasu; and Yamamoto, Tokio,3,654,776.
Yamato, Masaru, to Idemitsu Kosan Co., Ltd. Method for removing shellfishes and crustaceans gregariously settling on rubber hoses. 3,655,445, Cl. 134-42.
Yang, Frank Y., to Xerox Corporation. Fluidized development of electrostatic images. 3,654,900, Cl. 118-637.
Yankee, Herbert L., to Pratt & Whitney, Inc. Self-pointing thread rolling dies. 3,654,800, Cl. 72-469.
Yaoi, Hideaki: *See—*
Kono, Reisaku; Yamamoto, Shigeo; and Yaoi, Hideaki,3,655,872.
Yardney International Corporation: *See—*
Blossom, Raymond W.; and Charkey, Allen, 3,655,451.
Yarema, Raymond J.; and Studtmann, George H., to Borg-Warner Corporation. Multi-phase inverter using isolated direct current supplies for firing the SCRs. 3,656,047, Cl. 321-5.
Yasjukevich, Boris Ivanovich: *See—*
Artamonova, Nadezhda Ivanovna; Bushin, Leonid Mikhailovich; Besedin, Leonid Nikolaevich; Zhurenko, Anna Timofeevna; Urvantsev, Leonid Mikhailovich; Scherbakov, Jury Dmitrievich; Yasjukevich, Boris Ivanovich; Demin, Anatoly Anisimovich; and Peshkov, Evgeny Viktorovich,3,654,756.
Yasuda, Yukio; Tsuji, Nobuo; and Miyazako, Takushi, to Fuji Photo Film Co., Ltd. Color photographic light-sensitive material containing silver occlusion preventing agent. 3,655,389, Cl. 96-100.
Yasuhara, Yutaka; Nogi, Tatsuo; and Takahashi, Ikuzo, to Toray Industries, Inc. Carboxylation of metal aryloxides. 3,655,744, Cl. 260-521.
Yasuo, Suzuki, to Sun Koki Kabushiki Kaisha. Zoom lens for normal and close-up photography. 3,655,271, Cl. 350-187.
Yasutake, Katsuya: *See—*
Wada, Yoshiyo; and Yasutake, Katsuya,3,655,910.
Yates, Albert L.: *See—*
Schildkraut, Sid I.; Yates, Albert L.; and Cohn, Peter J.,3,655,482.
Yates, Paul C., to Du Pont de Nemours, E. I., and Company. High surface are stabilized silica sols and process for preparing same. 3,655,578, Cl. 252-313.
Yeh, Tsu-Hsing: *See—*
Duffy, Michael C.; Schumann, Paul A., Jr.; and Yeh, Tsu-Hsing,3,655,457.
Yellin, Bernard. Knockdown cube structure. 3,655,065, Cl. 211-177.
Yoichi, Hirokawa: *See—*
Kawada, Shin-Ichi; Yoichi, Hirokawa; and Masuzawa, Isao,3,656,043.
Yokogawa Electric Works, Ltd.: *See—*
Ohno, Isamu; Kobayashi, Akio; Ohte, Akira; Tamuki, Minoru; and Ohta, Susumu, 3,655,992.
Yoo, Jin Sun, to Atlantic Richfield Company. Olefin polymerization process. 3,655,811, Cl. 260-683.15
Yorston, Frederick H.; and Liebergott, Norman, to Pulp and Paper Research Institute of Canada. Two-stage purification of fibrous cellulose material employing gaseous chlorine dioxide in one stage and a peroxygen compound in the other. 3,655,505, Cl. 162-67.
Yoshida, Michio: *See—*
Kozu, Haruo; Kimura, Morio; Watanabe, Tadashi; Naozumi, Hiratsuka; and Yoshida, Michio,3,655,596.
Yoshikawa, Shogon: *See—*
Miyauchi, Tsuneshige; Hirano, Jiro; Ueki, Atsufumi; Tatsumi, Ryuji; Mukai, Kunihiro; and Yoshikawa, Shogon,3,655,259.
Yoshikawa, Yutaka. Heat insulating laminate. 3,655,502, Cl. 161-127.
Yoshitomi Pharmaceutical Industries, Ltd.: *See—*
Nakanishi, Michio; Tahara, Tetsuya; Imamura, Hiroshi; and Maruyama, Yutaka, 3,655,681.
Nakanishi, Michio; Tahara, Tetsuya; Imamura, Hiroshi; and Maruyama, Yutaka, 3,655,682.
Young, Edward G., to C.T. & R.E., Inc. Methods and means for treating surfaces. 3,655,444, Cl. 134-6.
Young, Geoffrey Tyndale, to National Research Development Corporation. Process for the synthesis of peptides using 4- pyridylmethyl and related groups for the protection of C-terminal carboxyl groups. 3,655,636, Cl. 260-112.5
Young, George, to Needle Industries Limited. Felting needle mounting means. 3,654,678, Cl. 28-4.
Young, Paul G.: *See—*
Hensley, Justin C., Jr.; and Young, Paul G.,3,655,517.
Young, Richard K., to Phillips Petroleum Company. Heating parison preforms in liquid fluorinated organic compound. 3,655,480, Cl. 156-256.
Young, Richard K.; and Dockery, Calvin D., to Phillips Petroleum Company. Surface treatment of interior of parison preform. 3,655,848, Cl. 264-98.
Young, Sherwood L., to American Standard, Inc. Flush tank apparatus. 3,654,637, Cl. 4-18.
Zaki, Wahib Nassif; Coulomb, Jean Marie Louis; and Lovgren, Peter, to Procter & Gamble Company, The. Enzyme containing detergent composition having improved physical and stability characteristics. 3,655,568, Cl. 252-99.
Zander, Maximilian: *See—*
Buffleb, Herbert; Franck, Heinz Gerhard; Oberkobusch, Rudolf; Turowski, Johannes; Collin, Gerd; and Zander, Maximilian,3,655,802.
Zanner, Johann: *See—*
Winkler, Friedrich; and Zanner, Johann,3,655,278.
Zaschke, Wolfgang: *See—*
Howe, Harald O.; and Zaschke, Wolfgang,3,654,952.
Zatko, Lester T., to Moskowitz, Philip L., (Trustee), mesne. Means for making pulleys. 3,654,790, Cl. 72-82.
Zavodny, Alfred T., to Continental Oil Company. Laser cell. 3,656,067, Cl. 331-94.5
Zegers, Theodoor W.: *See—*
Renken, Howard C.; and Zegers, Theodoor W.,3,655,538.
Zeleny, Peter Charles: *See—*
Zeleny, Victor Vaclav; and Zeleny, Peter Charles,3,655,175.
Zeleny, Victor Vaclav; and Zeleny, Peter Charles, to Silver Recovery Equipment Pty., Limited. Package unit for removing metal from a solution of the metal. 3,655,175, Cl. 266-22.
Zeman, Raymond F.: *See—*
Bauernfeind, Carl J.; and Zeman, Raymond F.,3,656,060.
Zeph, David L.: *See—*
Roeschlein, Eugene R.; Weiss, Donald C.; and Zeph, David L.,3,656,096.
Zerfahs, Arthur S.: *See—*
Turner, Charles L.; and Zerfahs, Arthur S.,3,655,282.

Zhurenko, Anna Timofeevna: *See*—
Artamonova, Nadezhda Ivanovna; Bushin, Leonid Mikhailovich; Besedin, Leonid Nikolaevich; Zhurenko, Anna Timofeevna; Urvantsev, Leonid Mikhailovich; Scherbakov, Jury Dmitrievich; Yasjukevich, Boris Ivanovich; Demin, Anatoly Anisimovich; and Peshkov, Evgeny Viktorovich,3,654,756.

Ziegler, George William, Jr.; Apa, Armand Samuel; and Heffner, Donald Elwood, to AMP Incorporated. Knurling tool. 3,654,793, Cl. 72-125.

Zieren, A., Dr., Chemiebau GmbH and Co., KG: *See*—
Gehrken, Hubert; Helms, Gerd; Keunecke, Gerhard; and Krimphove, Herbert, 3,655,521.

Zijlstra, Dirk Jogchum: *See*—
Moddemeijer, Jan H.; and Zijlstra, Dirk Jogchum,3,654,825.

Zimmerman, Joseph, to Du Pont de Nemours, E. I., and Company. High strength crystalline oriented filaments. 3,655,630, Cl. 260-78.

Zipper, Walter J.: *See*—
Johnson, Robert J.; and Zipper, Walter J.,3,655,952.

Zirkle, Charles L.: *See*—
Kaiser, Carl; and Zirkle, Charles L.,3,655,667.

Zocholl, Stanley E., to I-T-E Imperial Corporation. Solid state overcurrent device with variable frequency reference. 3,656,026, Cl. 317-36.

Zoecon Corporation: *See*—
Siddall, John B., 3,655,700.

Zollner, Georg: *See*—
Lehmann, Hans-Gunter; Zollner, Georg; and Wiechert, Rudolf,3,655,643.

Zompa, Thomas A., to Trina, Inc. Process of laminating a vinyl design to a vinyl backing sheet. 3,655,485, Cl. 156-256.

Zoppoth, Raymond C., to Xerox Corporation. Xerographic fusing method and apparatus. 3,655,280, Cl. 355-3.

Zubryckyj, Nicolas: *See*—
Evans, David J. I.; and Zubryckyj, Nicolas,3,655,364.

Zurla, Frank A.: *See*—
Carnevale, Richard J.; Howe, Leland D., Jr.; Metz, Thomas A.; Womack, Karl K.; and Zurla, Frank A.,3,656,123.

# LIST OF REISSUE PATENTEES

TO WHOM

## PATENTS WERE ISSUED ON THE 11TH DAY OF APRIL, 1972

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bereday, Sigmund. Upholstery cushion construction comprising a resilient padding. Re. 27,336, 4–11–72, Cl. 5—361.

Buzzards Corporation, The: *See*—
Francis, Samuel A. Re. 27,335.

Ciba-Geigy AG: *See*
Soiron, Karl, Rafael, and Stockar. Re. 27,333.

Coleman, Lester E., to The Lubrizol Corp. Sulfurized diels-alder adducts and lubricants containing the same. Re. 27,331, 4–11–72, Cl. 252—47.5.

Cowans, Kenneth W., to Hughes Aircraft Co. Cryogenic refrigerator adapted to miniaturization. Re. 27,338, 4–11–72, Cl. 62—6.

Cunningham, James A., and R. P. Williams, to Texas Instruments Inc. Multilevel ohmic contacts for semiconductor devices. Re. 27,325, 4–11–72, Cl. 317—234.

Dornbos, Russell H., to Gerwin Industries, Inc. Turnbuckles. Re. 27,339, 4–11–72, Cl. 29—175.

Dorr-Oliver Inc.: *See*—
Shaeffer, John A. Re. 27,326.

Eaton Corp.: *See*—
Jaeschke, Ralph L. Re. 27,337.

Formsprag Co.: *See*—
Kalns, Ilmars. Re. 27,327.

Forsberg, John W., to The Lubrizol Corp. Thermosetting resins derived from N-3-oxohydro carbon-substituted acrylamides. Re. 27,328, 4–11–72, Cl. 260—828.

Francis, Samuel A., to The Buzzards Corp. Aquatic probe. Re. 27,335, 4–11–72, Cl. 73—170.

Gerwin Industries, Inc.: *See*—
Dornbos, Russell H. Re. 27,339.

Hughes Aircraft Co.: *See*—
Cowans, Kenneth W. Re. 27,338.

International Flavors & Fragrances Inc.: *See*—
Somerville, Willard T., and Shuster. Re. 27,332.

International Harvester Co.: *See*—
Zimmerman, Richard F. Re. 27,334.

Jaeschke, Ralph L., to Eaton Corp. Eddy current coupling. Re. 27,337, 4–11–72. Cl. 310—105.

Kalns, Ilmars, to Formsprag Co. Balanced bi-directional no-back mechanism. Re. 27,327, 4–11–72, Cl. 192—8.

Lubrizon Corp., The: *See*—
Forsberg, John W. Re. 27,328.
Coleman, Lester E. Re. 27,331.

Magnavox Co., The: *See*—
Mayle, Louis F. Re. 27,329.

Marcmann, Emil G. Thermally insulated tank structure. Re. 27,330, 4–11–72, Cl. 220—9.

Mayle, Louis F., to The Magnavox Co. Search tune system for television receivers. Re. 27,329, 4–11–72, Cl. 178—5.8.

Rafael, Hans: *See*—
Soiron, Karl, Rafael, and Stockar. Re. 27,333.

Sheaffer, John A., to Dorr-Oliver Inc. Trunnion valve for continuous rotary filter. Re. 27,326, 4–11–72, Cl. 210—91.

Shuster, Edward J.: *See*—
Somerville, Willard T., and Shuster. Re. 27,332.

Soiron, Karl, H. Rafael, and W. Stockar, to Ciba-Geigy AG. Process for after treatment of freshly colored polyamide fibers. Re. 27,333, 4–11–72, Cl. 8—165.

Somerville, William T., and E. J. Shuster, to International Flavors & Fragrances Inc. Perfume compositions containing geranonitrile, cinnamyl nitrile or 2-nonenyl nitrile. Re. 27,332, 4–11–72, Cl. 252—522.

Stockar, Walter: *See*—
Soiron, Karl, Rafael, and Stockar. Re. 27,333.

Texas Instruments Inc.: *See*—
Cunningham, James A., and Williams. Re. 27,325.

Williams, Robert P.: *See*—
Cunningham, James A., and Williams. Re. 27,325.

Zimmerman, Richard F., to International Harvester Co. Multiple speed hydraulic control system. Re. 27,334, 4–11–72. Cl. 60—19.

# LIST OF PLANT PATENTEES

Armstrong, David L. to Armstrong Nurseries, Inc. Rose plant. 3,102, 4–11–72, Cl. 25.

Armstrong Nurseries, Inc.: *See*—
Armstrong, David L. 3,102.
McGredy, Samuel, IV. 3,111.

Bountiful Ridge Nurseries, Inc.: *See*—
Wilson, William J. and E. C. 3,110.

Cobia, Barnell L., to B. L. Cobia, Inc. Hoya carnosa rubra. 3,105, 4–11–72, Cl. 88.

Cobia, B. L., Inc.: *See*—
Cobia, Barnell L. 3,105.

Conard-Pyle Co.: *See*—
Flemer, William J., and W. Flemer III, to Treesearch. Elm tree. 3,108, 4–11–72, Cl. 61.

Flemer, William, III: *See*—
Flemer, William J., and W. Flemer III. 3,108.

Garabedian, John M. Grapevine. 3,106, 4–11–72, Cl. 47.

Jackson & Perkins Co.: *See*—
Tantau, Mathias. 3,103.

McGredy, Samuel, IV., to Armstrong Nurseries, Inc. Rose plant. 3,111, 4–11–72, Cl. 22.

Meilland, Alain, to Conard-Pyle Co. Rose plant. 3,104, 4–11–72, Cl. 18.

Scanlon, Edward H. European bird cherry tree. 3,107, 4–11–72, Cl. 37.

Schichtel, George V., to J. Frank Schmidt & Son Co. Maple tree. 3,109, 4–11–72, Cl. 51.

Schmidt, J. Frank, & Son Co.: *See*—
Schichtel, George V. 3,109.

Tantau, Mathias, to Jackson & Perkins Co. Rose plant. 3,103, 4–11–72, Cl. 24.

Treesearch: *See*—
Flemer, William J., and W. Flemer III. 3,108.

Wilson, William J., and E. C., to Bountiful Ridge Nurseries, Inc. Apple tree. 3,110, 4–11–72, Cl. 34.

Wilson, Emory C.: *See*—
Wilson, William J. and E. C. 3,110.

# LIST OF DESIGN PATENTEES

Adams, Franklin E. Quiver. 223,353, 4–11–72, Cl. D22—13.

Agrati, Eugenio, and E. Sala. Combined motion picture projector and cover therefore. 223,408, 4–11–72, Cl. D61—1.

Allen, Davis B., to The General Fireproofing Co. Desk. 223,371, 4–11–72, Cl. D33—7.

Allen, Davis B., to The General Fireproofing Co. Desk. 223,372, 4–11–72, Cl. D33—7.

Alpa Corp.: *See*—
Minas, Harold Y. 223,349.

Ambrose, Paul E., to Pantasote Co. Rubber glove. 223,330, 4–11–72, Cl. D2—374.

American Can Co.: *See*—
Batchelar, Raymond L., and Heinle. 223,388.

American Greetings Corp.: *See*—
Sandwich, William. 223,413.

Ampex Corp.: *See*—
Martin, Albert W. 223,363.
Larson, Orville W. 223,366.
Larson, Orville W. 223,410.

Anderson, Eldon L., Jr., to General Electric Co. Luminaire. 223,394, 4–11–72, Cl. D48—31.

Anderson, Harold C., to Litton Systems, Inc. Microwave testing meter. 223,359, 4–11–72, Cl. D26—1.

Argo Industries Corp.: *See*—
Gottlieb, Robert. 223,383.

Atlas Rand Corp.: *See*—
Emmerling, Roland A. 223,411.

Austin, Lee C., to R. E. Austin & So. Rigid removable, protective cover for a gymnasium vaulting horse with pommels. 223,378, 4–11–72, Cl. D34—5.

Austin, R. E., & Son: *See*—
Austin, Lee C. 223,378.

Barlow, Gordon A., to Marvin Glass & Associates. Game board. 223,377, 4–11–72, Cl. D34—5.

Batchelar, Raymond L., and C. W. Heinle, to American Can Co. Container end. 223,338, 4–11–72, Cl. D9—255.

Beckwith, Robert W. Relay cabinet. 223,365, 4–11–72, Cl. D26—13.

Benty, John L., to Bristol-Myers Co. Heater housing for hair curlers. 223,421, 4–11–72, Cl. D86—10.

Blease, Wilfred J., to Pioneer Plastics, Inc. Celery crisper or similar article. 223,384, 4–11–72, Cl. D44—1.

Blumcraft of Pittsburgh: *See*—
Horgan, William J., Jr. 223,332.

Bombardier Ltd.: *See*—
Lapointe, Yves A., and Delisle. 223,414.

Bordinat, Eugene, Jr., to Ford Motor Co. Dual purpose vehicle tire. 223,427, 4–11–72, Cl. D90—20.

Boyle, George H. Combined ladder and platform for picking fruit. 223,348, 4–11–72, Cl. D6—99.

# LIST OF DESIGN PATENTEES


**Brainerd, Andrew W., K. H. Brainerd, and S. W. Brainerd.** Unitary shoe-polishing device. 223,423, 4–11–72, Cl. D86—11.

**Brainerd, Kent H.:** *See*—
Brainerd, Andrew W. K. H., and S. W. 223,423.

**Brainerd, Stuart W.:** *See*—
Brainerd, Andrew W. K. H., and S. W. 223,423.

**Braun A.G.:** *See*—
Rams, Dieter. 223,393.
Seiffert, Florian. 223,425.
Rams, Dieter. 223,391.
Rams, Dieter. 223,392.
Rams, Dieter. 223,422.

**Bristol-Myers Co.:** *See*—
Benty, John L. 223,421.

**Brounn, Morrison J., to Otis Elevator Co.** Elevator car entrance with signal fixtures in the entrance columns. 223,340, 4–11–72, Cl. D13—1.

**Carpenter, Lindell O., and R. M. Ferguson, to Container Corp. of America.** Kite. 223,381, 4–11–72, Cl. D34—15.

**Clark, Malcolm B., assignor of a fractional partinterest to Ronald A. Clark.** Building block. 223,352, 4–11–72, Cl. D18—2.

**Clark, Ronald A.:** *See*—
Clark, Malcolm B. 223,352.

**Computer Transmission Corp.:** *See*—
Ortega, Charles J., and Naff. 223,360.

**Container Corp. of America:** *See*—
Carpenter, Lindell O., and Ferguson. 223,381.

**Grain, William W., to Document or Sciences Corp.** Electronic machine for use in document processing. 223,361, 4–11–72, Cl. D26—5.

**Cruz, Wilford:** *See*—
Kim, Marjorie M. 223,380.

**Delisle, Pierre:** *See*—
Lapointe, Yves A., and Delisle. 223,414.

**DeLuca, Paul V., to Porta Systems Corp.** Combined electronic test panel and notation pad. 223,364, pub. 4–11–72, Cl. D26—13.

**Diks & Coenen N.V.:** See—
Neerincx, Joseph E. 223,331.

**Documentor Sciences Corp.:** *See*—
Crain, William W. 223,361.

**Donoghue, Robert J.** Bottle and closure therefor. 223,335, 4–11–72, Cl. D9—10.

**Duvall, Leroy F., and C. D. Stone, to The Quaker Oats Co.** Expanded cereal food product. 223,326, 4–11–72, Cl. D1—1.

**Elvestad, Leif.** Combined bar cabinet and refrigerator. 223,373, 4–11–72, Cl. D33—19.

**Emmerling, Roland A., to Atlas-Rand Corp.** Motion picture camera. 223,411, 4–11–72, Cl. D61—1.

**Etablissements Allibert:** See—
Firdmann, Jacques. 223,374.

**Ferguson, Robert M.:** *See*—
Carpenter, Lindell O., and Ferguson. 223,381.

**Fetty, Harold D.:** *See*—
Granger, Dennis B., and Fetty. 223,426.

**Finkel, Henry, to W. L. Plastics and Metal Producers Co., Ltd.** Desk calendar holder. 223,415. 4–11–72, Cl. D74—5.

**Firdmann, Jacques, to Etablissements Allibert.** Cabinet. 223,374, 4–11–72, Cl. D33—19.

**Ford Motor Co.:** *See*—
Bordinat, Eugene, Jr. 223,427.

**Fuji Shashin Film Kabushiki Kaisha:** *See*—
Mizukawa, Shigeo, and Fukuda. 223,407.
Fukuda, Masahiro, and Mixukawa. 223,409.

**Fukuda, Masahiro:** *See*—
Mizukawa, Shiego, and Fukuda. 223,407.

**Fukuda, Masahiro, and S. Mizukawa, to Fuji Shashin Film Kabushiki Kaisha.** Camera. 223,409, 4–11–72, Cl. D61—1.

**General Electric Co.:** *See*—
Anderson, Eldon L., Jr. 223,394.

**General Fireproofing Co., The:** *See*—
Allen, Davis B. 223,372.
Allen, Davis B. 223,371.

**Gibson, Sidney.** Combined reflector and housing for table lamp or the like. 223,387. 4–11–72. Cl. D48—20.

**Glantz, Samuel N. and M.** Combined carrying bag and racket case. 223,424. 4–11–72, Cl. D87—1.

**Glass, Marvin, & Associates:** *See*—
Barlow, Gordon A. 223,377.

**Goodyear Tire & Rubber Co.:** *See*—
Granger, Dennis B., and Fetty. 223,426.

**Gottlieb, Robert, to Argo Industries Corp.** Cage for a popcorn popper. 223,383, 4–11–72, Cl. D44—1.

**Granger, Dennis B., and H. D. Fetty, to Goodyear Tire & Rubber Co. Tire.** 223,426, 4–11–72, Cl. D90—20.

**Gruber, Alvin.** Samovar or the like. 223,385, 4–11–72, Cl. D44—26.

**Harris, Ewell J.** Fish lure. 223,354, 4–11–72, Cl. D22—27.

**Hayes, Thomas H., and G. B. Zinnbauer, to Eli Lilly and Co.** Bottle. 223,334, 4–11–72, Cl. D9—45.

**Heinle, Carl W.:** *See*—
Batchelar, Raymond L, and Heinle. 223,338.

**Hess, Ann M.** Cordless vibrating massager or similar article. 223,418, 4–11–72, Cl. D83—1.

**Horak, Martin S., to Vikoa, Inc.** Amplifier housing. 223,368, 4–11–72. Cl. D26—14.

**Horgan, William J., Jr., to Blumcraft of Pittsburgh.** Combined door handle and lock housing. 223,332, 4–11–72, Cl. D8—138.

**Houger, Leroy G.** Wheel assembly for trailers. 223,341, 4–11–72, Cl. D14—3.

**International Playtex Corp.:** *See*—
Sachs, Charles M. 223,327.

**International Silver Co.:** *See*—
Toffolon, Siro R. 223,405.
Toffolon, Siro R. 223,406.

**Ishimaru, Lloyd Y.:** *See*—
Shimano, Moto, Zierhut, and Ishimaru. 223,362.
Shimano, Moto, Zierhut, and Ishimaru. 223,429.

**Jackson, James W.** Dog boot. 223,369, 4–11–72, Cl. D30—34.

**Johns-Manville Corp.:** *See*—
Voigt, Paul A. 223,351.

**K-S-H, Inc.:** *See*—
Shalhut, Leo G. 223,386.

**Kachler, Robert S.** Dragster. 223,344, 4–11–72, Cl. D14—3.

**Kenco Products Corp.:** *See*—
Tall, Nathan I. and K. I. 223,428.

**Kim, Marjorie M., to Wilford Cruz.** Magnetic game table. 223,380, 4–11–72, Cl. D34—5.

**Kirkpatrick, George A.** Dolly for handling rolls of carpeting. 223,343, 4–11–72, Cl. D14—3.

**Kiss, Steven.** Dispenser holder. 223,376, 4–11–72, Cl. D33—30.

**Kountz, John C.** Magnetic tape reel adapter. 223,367, 4–11–72, Cl. D26—14.

**Kuchar, Joseph, to Record Chemical Co., Inc.** Dispensing container for chemicals. 223,337, 4–11–72, Cl. D9—218.

**Kuklinski, Rosemarie T.** Hat, or similar article. 223,328, 4–11–72, Cl. D2—257.

**Kuroki, Fuyo.** Spinning reel. 223,355, 4–11–72, Cl. D22—25.

**Laco Mfg. Co.:** *See*—
Lacy, Thomas W., Jr. 223,357.

**Lacy, Thomas W. Jr., to Laco Mfg. Co.** Pump. 223,357, 4–11–72, Cl. D23—14.

**Lamb, Thomas.** Chair. 223,347, 4–11–72, Cl. D15—1.

**Lapointe, Yves A., and P. Delisle, to Bombardier Ltd.** Watercraft. 223,414, 4–11–72. Cl. D71—1.

**Larson, Orville W., to Ampex Corp.** Magnetic tape television apparatus. 223,366, 4–11–72, Cl. D26—14.

**Larson, Orville W., to Ampex Corp.** Television camera. 223,410, 4–11–72, Cl. D61—1.

**Lilly, Eli, and Co.:** *See*—
Hayes, Thomas H., and Zinnbauer. 223,334.

**Lindgren, Wallace I.** Tool handle structure. 223,333, 4–11–72, Cl. D8—83.

**Litton Systems, Inc.:** *See*—
Anderson, Harold C. 223,359.

**Mackeen, Anthony D., to Skiroule Limitee.** Fuel tank for snowmobiles. 223,346, 4–11–72, Cl. D14—24.

**Marg, Joseph.** Combined pour spout and hanger for a container. 223,339, 4–11–72, Cl. D9—290.

**Marshall, Jonny Howard.** Clothes hanger transporter. 223,416, 4–11–72, Cl. D80—8.

**Martin, Albert W., to Ampex Corp.** Magnetic tape transport. 223,363, 4–11–72, Cl. D26—5.

**McGoff, Francis P.** Waste paper basket. 223,402, 4–11–72. Cl. D49—30.

**Meisner, Edward H., to Red Devil Inc.** Razor blade scraper. 223,401, 4–11–72, Cl. D49—23.

**Minas, Harold Y., to Alpa Corp.** Photometer. 223,349, 4–11–72, Cl. D16—2.

**Mizukawa, Shigeo:** *See*—
Fukuda, Masahiro, and Mizukawa. 223,409.

**Mizukawa, Shigeo, and M. Fukuda, to Fuji Shashin Film Kabushiki Kaisha.** Motion picture camera. 223,407, 4–11–71, Cl. D61—1.

**Mori Denki Mfg. Co., Ltd.:** *See*—
Mori, Shinjiro, and Takamatsu. 223,390.

**Mori, Shinjiro, and T. Takamatsu, to Mori Denki Mfg. Co., Ltd.** Combined socket handle and lamp guard. 223,390, 4–11–72. Cl. D48—24.

**Murray, Robert J.** Clock. 223,382, 4–11–72, Cl. D42—7.

**Naff, Frederic L., Jr.:** *See*—
Ortega, Charles J., and Naff. 223,360.

**Neerincx, Joseph E., to Diks & Coenen N.V.** Combined bunk bed head board, blackboard and folding desk or similar article. 223,331, 4–11–72. Cl. D5—4.

**Nippon Rubber Co., Ltd.:** *See*—
Oshima, Takeshi. 223,329.

**Northrop Corp.:** *See*—
Smith, Robert L. 223,342.

**Nycum, Thomas G.** Golf cart. 223,345, 4–11–72, Cl. D14—3.

**Ortega, Charles J., and F. L. Naff, Jr., to Computer Transmission Corp.** Housing for communications terminal. 223,360, 4–11–72, Cl. D26—5.

**Oshima, Takeshi, to Nippon Rubber Co., Ltd.** Shoe. 223,329, 4–11–72, Cl. D2—310.

**Otis Elevator Co.:** *See*—
Brounn, Morrison J. 223,340.

**Pantasote Co.:** *See*—
Ambrose, Paul E. 223,330.

**Pearl, Morton S.** Book support or the like. 223,370, 4–11–72, Cl. D33—2.

**Pettibon, Burl R.** Precision cervical vetebrae adjusting instrument. 223,419, 4–11–72, Cl. D83—1.

**Pickett, John E. P.** Apparatus for the preparation and embedding of tissue specimens. 223,350, 4–11–72, Cl. D16—2.

**Pioneer Plastics, Inc.:** *See*—
Blease, Wilfred J. 223,384.

**Plastics, W. L., and Metal Producers Co., Ltd.:** *See*—
Finkel, Henry. 223,415.

**Porta Systems Corp.:** *See*—
De Luca, Paul V. 223,364.

**Porter, William P.** Pipeline vent. 223,358, 4–11–72, Cl. D23—41.

**Quaker Oats Co., The:** *See*—
Duvall, Leroy F., and Stone. 223,326.

**Rams, Dieter, to Braun A.G.** Table lighter. 223,391, 4–11–72, Cl. D48—27.

**Rams, Dieter, to Braun A.G.** Table lighter. 223,392, 4–11–72, Cl. D48—27.

**Rams, Dieter, to Braun A.G.** Table cigarette lighter. 223,393, 4–11–72, Cl. D48—27.

**Rams, Dieter, to Braun A.G.** Hair dryer. 223,422, 4–11–72, Cl. D86—10.

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Record Chemical Co., Inc. : *See*—
Kuchar, Joseph. 223,337.
Red Devil Inc. : *See*—
Meisner, Edward H. 223,401.
Rite Autoronics Corp. : *See*—
Schwartz, Edwin L. 223,404.
Sachs, Charles M., to International Playtex Corp. Brassiere. 223,327, 4–11–72, Cl. D2—24.
Sala, Ennio. : *See*—
Agrati, Eugenio, and Sala. 223,408.
Sandwick, William, to American Greetings Corp. Font of type. 223,413, 4–11–72, Cl. D64—17.
Scanthin Electronics, Inc. : *See*—
Shimano, Moto, Zierhut, and Ishimaru. 223,362.
Shimano, Moto, Zierhut, and Ishimaru. 223,429.
Schifrin, Arthur. Combined spot light and plug therefor. 223,389, 4–11–72, Cl. D48—20.
Schwartz, Edwin L., to Rite Autoronics Corp. Vehicle instrument gauge. 223,404, 4–11–72, Cl. D52—6.
Seiffert, Florian, to Braun A.G. Combined coffee mill and grinder. 223,425, 4–11–72, Cl. D89—1.
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Selden, Robert W., to Weyerhaeuser Co. Light standard or similar article. 223,396, 4–11–72, Cl. D48—31.
Selden, Robert W., to Weyerhaeuser Co. Light standard or similar article. 223,397, 4–11–72, Cl. D48—31.
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Selden, Robert W., to Weyerhaeuser Co. Light standard or similar article. 223,388, 4–11–72, Cl. D48—20.
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Sharp, Clellmont L. Container for chlorine pellets or the like. 223,356, 4–11–72, Cl. D23—2.
Shimano, Moto, C. D. Zierhut, and L. Y. Ishimaru, to Scantlin Electronics, Inc. Cathode ray tube display terminal. 223,362, 4–11–72, Cl. D26—3.
Shimano, Moto, C. D. Zierhut, and L. Y. Ishimaru, to Scantlin Electronics, Inc. Cathode ray tube display housing. 223,429, 4–11–72, Cl. D96—9.
Skiroule Limitee : *See*—
Mackeen, Anthony D. 223,346.
Smith, Julia. Drainage tray for soap or the like. 223,375, 4–11–72, Cl. D33—24.
Smith, Kenneth A. Dispensing tray for plastic bags and the like. 223,403, 4–11–72, Cl. D52—2.
Smith, Robert L., to Northrop Corp. Portable beverage dispenser. 223,342, 4–11–72, Cl. D14—3.
Stone, Charles D. : *See*—
Duvall, Leroy F., and Stone. 223,326.
Takamatsu, Takezo : *See*—
Mori, Shinjiro. 223,390.
Tall, Kenneth I. : *See*—
Tall, Nathan I. and K. I. 223,428.
Tall, Nathan I. and K. I., to Kenco Products Corp. Beverage dispenser. 223,428, 4–11–72, Cl. D94—3.
Tanaka Shoji Kabushiki Kaisha : *See*—
Tanaka, Yoshihisa. 223,420.
Tanaka, Yoshihisa, to Tanaka Shoji Kabushiki Kaisha. Cigarette dispenser. 223,420, 4–11–72, Cl. D85—2.
Taylor, James C. Gift package for golf accessories. 223,336, 4–11–72, Cl. D9—193.
Toffolon, Siro R., to International Silver Co. Spoon or similar article of flatware. 223,405, 4–11–72, Cl. D54—12.
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Tong, Duncan. Base for natural or artificial flowers. 223,379, 4–11–72, Cl. D35—3.
Trenka, Lew J. Motion picture camera. 223,412, 4–11–72, Cl. D61—1.
Weyerhaeuser Co. : *See*—
Selden, Robert W. 223,388.
Selden, Robert W. 223,396.
Selden, Robert W. 223,397.
Selden, Robert W. 223,398.
Selden, Robert W. 223,399.
Selden, Robert W. 223,400.
Wilson, Robert G. Self-service food warmer. 223,417, 4–11–72. Cl. D81—10.
Vikoa, Inc. : *See*—
Horak, Martin S. 223,368.
Voigt, Paul A., to Johns-Manville Corp. Ceiling panel. 223,351, 4–11–72, Cl. D18—2.
Zierhut, Clarence D. : *See*—
Shimano, Moto, Zierhut, and Ishimaru. 223,362.
Shimano, Moto, Zierhut, and Ishimaru. 223,429.
Zinnbauer, Gerald B. : *See*—
Hayes, Thomas H., and Zinnbauer. 223,334.

# CLASSIFICATION OF PATENTS

## ISSUED APRIL 11, 1972

NOTE.—First number, class; second number, subclass; third number, patent number

**CLASS 2**

14J 3,654,631
49 3,654,629
67 3,654,630
125 3,654,632
153 3,654,633
224A 3,654,634
266 3,654,635

**CLASS 4**

7 3,654,636
18 3,654,637
110 3,654,638
172.19 3,654,639
3,654,640
257 3,654,641

**CLASS 5**

13 3,654,642
81B 3,654,643
81 3,654,644
99 3,654,645
334C 3,654,646
361 Re.27,336

**CLASS 7**

5.3 3,654,647

**CLASS 8**

121 3,655,326
130.1 3,655,327
149.1 3,655,328
165 Re.27,333

**CLASS 9**

1R 3,654,648
9 3,654,649

**CLASS 10**

155 3,654,650

**CLASS 12**

12.5 3,654,651

**CLASS 13**

31 3,655,902
3,655,903

**CLASS 14**

1 3,654,652
72 3,654,653

**CLASS 15**

1.5 3,654,654
21A 3,654,655
24 3,654,656
215 3,654,657
248A 3,654,658
302 3,654,662
306A 3,654,659
308 3,654,660
333 3,654,661

**CLASS 16**

147 3,654,663

**CLASS 17**

25 3,654,664
32 3,654,665
76 3,654,666

**CLASS 19**

112 3,654,667

**CLASS 23**

50R 3,655,329
52 3,655,330
63 3,655,331
88 3,655,332
89 3,655,333
106 3,655,334
107 3,655,335
117 3,655,336
122 3,655,337
129 3,655,338
142 3,655,339
209.1 3,655,340
209.4 3,655,341
219 3,655,342
281 3,655,346
284 3,655,343
299 3,655,344
301SP 3,655,345
312 3,655,347
315 3,655,348

**CLASS 24**

16PB 3,654,669
16R 3,654,668
70SK 3,654,670
102T 3,654,671
136K 3,654,672
208A 3,654,673
243K 3,654,674

**CLASS 27**

1 3,654,675
2 3,654,676

**CLASS 28**

1.3 3,654,677
4R 3,654,678
73 3,654,679

**CLASS 29**

25.16 3,654,680
95 3,654,681
96 3,654,682
3,655,969
149.5NM 3,654,684
149.5B 3,654,683
175R Re.27,339
196.4 3,655,349
200R 3,654,685
240 3,654,688
280 3,654,686
421 3,654,687
427 3,654,689
3,654,690
446 3,654,691
558 3,654,692
564 3,654,693
587 3,654,694
593 3,654,695
604 3,654,697
623 3,654,696

**CLASS 30**

4R 3,654,698
133 3,654,699
247 3,654,700
346.56 3,654,701

**CLASS 32**

14A 3,654,702
17 3,654,703

**CLASS 33**

18B 3,654,704

**CLASS 34**

10 3,654,705

**CLASS 35**

9A 3,654,707
3,654,708
9D 3,654,706
13 3,654,709
29R 3,654,710
66 3,654,711
73 3,654,712

**CLASS 37**

80A 3,654,713

**CLASS 38**

16 3,654,714
77.5 3,654,715

**CLASS 40**

33 3,654,716
126A 3,654,717
145 3,654,718
156 3,654,719

**CLASS 42**

75A 3,654,720

**CLASS 43**

6.5 3,654,721
25 3,654,722
26.1 3,654,723
42.06 3,654,724
44.99 3,654,725

**CLASS 44**

10R 3,655,350
66 3,655,351

**CLASS 46**

16 3,654,726
17 3,654,727
39 3,654,728
80 3,654,729

**CLASS 49**

34 3,654,730
127 3,654,732
168 3,654,733
504 3,654,731
505 3,654,734

**CLASS 51**

5 3,654,735
9 3,654,736
66 3,654,737
139 3,654,738
141 3,654,739

**CLASS 52**

115 3,655,859
222 3,654,740
720 3,654,741
744 3,654,742

**CLASS 53**

22 3,654,744
26 3,654,745
37 3,654,746
88 3,654,743

**CLASS 55**

126 3,654,747
322 3,654,748

**CLASS 56**

15.8 3,654,749
16.2 3,654,750
27.5 3,654,753
56 3,654,751
98 3,654,752
400.17 3,654,754

**CLASS 57**

23 3,654,755
34R 3,654,756

**CLASS 58**

23A 3,654,757

**CLASS 60**

19 Re.27,334
3,654,758
26 3,654,759
52VS 3,654,760
53B 3,654,761
53R 3,654,762
294 3,654,763
324 3,654,764

**CLASS 61**

11 3,654,765
50 3,654,766
53.64 3,654,767

**CLASS 62**

5 3,654,768
6 Re.27,338
23 3,654,769
320 3,654,770
352 3,654,771
353 3,654,772
371 3,654,773

**CLASS 63**

14C 3,654,774

**CLASS 64**

13 3,654,775
25 3,654,776
30 3,654,777

**CLASS 65**

3 3,655,353
4 3,655,352
24 3,655,354
83 3,655,355
182R 3,655,356

**CLASS 66**

145S 3,654,778
171 3,654,779

**CLASS 68**

222 3,654,780

**CLASS 69**

41 3,654,781

**CLASS 70**

276 3,654,782
349 3,654,783

**CLASS 71**

1 3,655,357
34 3,655,358
94 3,655,359

**CLASS 72**

5 3,654,784
28 3,654,785
53 3,654,786
56 3,654,787
3,654,788
76 3,654,789
82 3,654,790
88 3,654,791
114 3,654,792
125 3,654,793
285 3,654,794
329 3,654,795
345 3,654,796
393 3,654,797
412 3,654,798
454 3,654,799
469 3,654,800

**CLASS 73**

28 3,654,801
37.5 3,654,802
71.4 3,654,803
71.6 3,654,804
118 3,654,805
170A Re.27,335
178R 3,654,806
180 3,654,807
355R 3,654,809
384 3,654,808

**CLASS 74**

54 3,654,810
101 3,654,811
200 3,654,812
232 3,654,813
243R 3,654,814
331 3,654,818
360 3,654,819
410 3,654,815
424.8R 3,654,816
495 3,654,820
568R 3,654,817
612 3,654,821
681 3,654,822

**CLASS 75**

.5AC 3,655,360
60 3,655,361
68A 3,655,362
101R 3,655,363
103 3,655,364
120 3,655,399
123J 3,655,365
3,655,366
156.5 3,655,367
170 3,655,368

**CLASS 76**

82 3,654,823

**CLASS 81**

3.8 3,654,824
72 3,654,825

**CLASS 82**

1.2 3,654,826
25 3,654,827

**CLASS 83**

23 3,654,828
78 3,654,829
208 3,654,830

**CLASS 84**

1.01 3,655,904
435 3,654,831

**CLASS 85**

45 3,654,832

**CLASS 91**

41 3,654,833
399 3,654,834
436 3,654,835
448 3,654,836
461 3,654,837

**CLASS 92**

24 3,654,838
200 3,654,839
222 3,654,840

**CLASS 93**

33H 3,654,841
94PS 3,654,842

**CLASS 95**

10CE 3,654,843
42 3,654,844
53EB 3,654,845
53E 3,654,846
63 3,654,847
89R 3,654,848

**CLASS 96**

1 3,655,369
1.1 3,655,371
1.3 3,655,370
3,655,372
1.4 3,655,373
3,655,374
3,655,375
1.5 3,655,376
3,655,377
3,655,378
27 3,655,379
29 3,655,380
33 3,655,381
48 3,655,382
64 3,655,383
67 3,655,384
87A 3,655,386
3,655,387
99 3,655,388
100 3,655,389
108 3,655,390
3,655,394
109 3,655,391
114 3,655,407
131 3,655,392
140 3,655,393

**CLASS 98**

40DL 3,654,849
61 3,654,850
110 3,654,851

**CLASS 99**

2R 3,655,395
9 3,655,396
65 3,655,397
71 3,655,398
80PS 3,655,400
80R 3,655,385
85 3,655,401
86 3,655,402
91 3,655,403
92 3,655,404
94 3,655,405
125 3,655,409
140R 3,655,408
148C 3,655,406
171R 3,655,410
323 3,654,852
330 3,655,411
359 3,654,853

**CLASS 100**

52 3,654,854
229 3,654,855

**CLASS 101**

40 3,654,856
93C 3,654,857
3,654,859
110 3,654,860
183 3,654,861
269 3,654,858
3,654,862
335 3,654,863
426 3,654,864
463 3,654,865

**CLASS 102**

2 3,655,413
23 3,654,866
37.4 3,654,867

**CLASS 104**

2 3,654,868
114 3,654,869

**CLASS 105**

197DB 3,654,870
3,654,871
239 3,654,872
248 3,654,873

**CLASS 106**

1 3,655,412
38.8 3,655,414
42 3,655,415
155 3,655,416
288B 3,655,417
304 3,655,418

**CLASS 108**

51 3,654,874
3,654,875
3,654,876
56 3,654,877
103 3,654,878
110 3,654,879

**CLASS 109**

25 3,654,880

**CLASS 110**

8C 3,654,881

**CLASS 112**

121.11 3,654,882
245 3,654,883
410 3,654,884

**CLASS 114**

.5D 3,654,886
.5F 3,654,885
72 3,654,887
240R 3,654,888

**CLASS 115**

35 3,654,889

**CLASS 116**

121 3,654,890
124 3,654,891
129 3,654,892

**CLASS 117**

17.5 3,655,419
45 3,655,421
46CA 3,655,422
47 3,655,423
68.5 3,655,424
75 3,655,426
76P 3,655,427
100M 3,655,425
106R 3,655,428
107 3,655,430
126R 3,655,431
138.8A 3,655,420
138.8E 3,655,433
138.8F 3,655,432
139 3,655,434
139.5A 3,655,435
139.5C 3,655,436
161ZB 3,655,437
201 3,655,438
212 3,655,439
227 3,655,440
237 3,655,441

**CLASS 118**

2 3,654,893
17 3,654,894
48 3,654,895
50 3,654,896
69 3,654,897
323 3,654,898
419 3,654,899
637 3,654,900
3,654,901
3,654,902

**CLASS 119**

15 3,654,903
18 3,654,904

**CLASS 123**

32EA 3,654,905
43A 3,654,906
44 3,654,907
140MC 3,654,908
141R 3,654,909
148E 3,654,910

**CLASS 126**

41R 3,654,912
121 3,654,913

**CLASS 127**

58 3,655,442
70 3,655,443

**CLASS 128**

1R 3,654,914
2.05M 3,654,915
2.06A 3,654,916
26 3,654,917
33 3,654,918
64 3,654,919
71 3,654,920

75 3,654,921
3,654,922
84R 3,654,923
214D 3,654,924
272 3,654,925
3,654,926
287 3,654,929
290H 3,654,927
290 3,654,928
305 3,654,911
325 3,654,930
327 3,654,931
350V 3,654,932
418 3,654,933

**CLASS 131**

267 3,654,934

**CLASS 132**

5 3,654,935
7 3,654,936
40 3,654,937
53 3,654,938
88.7 3,654,939

**CLASS 134**

2 3,654,940
6 3,655,444
42 3,655,445
59 3,654,941

**CLASS 136**

23 3,655,446
30 3,655,447
86C 3,655,448
107 3,655,449
3,655,450
111 3,655,452
121 3,655,453
126 3,655,451
175 3,655,455
181 3,655,456

**CLASS 137**

1 3,654,942
9 3,654,943
81.5 3,654,944
3,654,945
3,654,946
3,654,947
118 3,654,948
155 3,654,949
219 3,654,950
355.16 3,654,951
363 3,654,952
395 3,654,953
400 3,654,954
423 3,654,955
558 3,654,956
596.14 3,654,957
3,654,958
605 3,654,959
608 3,654,960
624.13 3,654,961
625.11 3,654,962
625.65 3,654,963

**CLASS 138**

30 3,654,964
89 3,654,965
141 3,654,966
144 3,654,967
176 3,654,968

**CLASS 141**

106 3,654,969
284 3,654,970

**CLASS 143**

52R 3,654,971
52 3,654,972

**CLASS 144**

178 3,654,973

**CLASS 145**

50A 3,654,974
75 3,654,975

**CLASS 146**

49B 3,654,976
70.1 3,654,977
98 3,654,978
215 3,654,979

**CLASS 148**

1.5 3,655,457
11.5F 3,655,458
12 3,655,459
13.1 3,655,460
23 3,655,461
32.5 3,655,462
101 3,655,463
3,655,464
134 3,655,465
145 3,655,466

**CLASS 156**

22 3,655,467
62.2 3,655,468
63 3,655,469
79 3,655,470
132 3,655,454
148 3,655,471
156 3,655,472
157 3,655,473
178 3,655,474
197 3,655,475
3,655,476
202 3,655,477
3,655,478
212 3,655,479
256 3,655,480
3,655,485
272 3,655,481
3,655,483
276 3,655,482
293 3,655,484
360 3,655,486
380 3,655,487
3,655,488
429 3,655,489
435 3,655,490
459 3,655,491
541 3,655,492

**CLASS 157**

1.1 3,654,980

**CLASS 159**

6 3,654,981

**CLASS 160**

199 3,654,982
348 3,654,983

**CLASS 161**

5 3,655,493
3,655,494
16 3,655,495
39 3,655,496
62 3,655,497
88 3,655,499
104 3,655,500
109 3,655,501
127 3,655,502
165 3,655,503
3,655,504
172 3,655,498

**CLASS 162**

67 3,655,505
164 3,655,506
358 3,655,507

**CLASS 164**

26 3,654,984
72 3,654,985
173 3,654,986
369 3,654,987

**CLASS 165**

17 3,654,988
47 3,654,989

**CLASS 166**

279 3,654,993
281 3,654,990
3,654,991
3,654,992
308 3,654,994
313 3,654,995

**CLASS 169**

2 3,654,996

**CLASS 171**

58 3,654,997

**CLASS 172**

6 3,654,998
311 3,654,999
804 3,655,000

**CLASS 174**

11R 3,655,905
52PE 3,655,906
77R 3,655,907

**CLASS 175**

213 3,655,001

**CLASS 176**

5 3,655,508

**CLASS 177**

70 3,655,002
173 3,655,003

**CLASS 178**

5.4CD 3,655,908
5.4ST 3,655,909
5.4R 3,655,916
5.8R Re.27,329
6.6A 3,655,910
3,655,912
6.8 3,655,911
69.5DC 3,655,913
69.5F 3,655,914

**CLASS 179**

2DP 3,655,915
15BS 3,655,917
18ET 3,655,921
18GF 3,655,918
3,655,919
3,655,920
18E 3,655,922
100.2C 3,655,923
100.2D 3,655,924

**CLASS 180**

6.48 3,655,004
7R 3,655,005
77R 3,655,006

**CLASS 181**

33HC 3,655,009
33E 3,655,007
3,655,008
36B 3,655,010
48 3,655,011

**CLASS 182**

163 3,655,012

**CLASS 186**

1AC 3,655,013

**CLASS 188**

32 3,655,014
71.7 3,655,015
181T 3,655,016
321 3,655,017

**CLASS 192**

4A 3,655,018
8 Re.27,327
48.9 3,655,019
142R 3,655,020

**CLASS 193**

35A 3,655,021

**CLASS 194**

2 3,655,022

**CLASS 195**

1.5 3,655,509
28R 3,655,510
3,655,511
3,655,512
66A 3,655,514
66R 3,655,513
103.5R 3,655,516
103.5 3,655,515

**CLASS 197**

114R 3,655,023

**CLASS 198**

20T 3,655,024
24 3,655,025
25 3,655,026
33AA 3,655,027
3,655,028
127R 3,655,029
135 3,655,030
138 3,655,031
220BC 3,655,032
3,655,033

**CLASS 200**

11TW 3,655,925
50A 3,655,926
61.45R 3,655,929
61.45 3,655,928
61.6 3,655,927
144B 3,655,930
148J 3,655,931
153LA 3,655,932
159R 3,655,933
166C 3,655,934
166H 3,655,935

**CLASS 202**

108 3,655,518
234 3,655,517

**CLASS 203**

6 3,655,519
3,655,520
28 3,655,521
59 3,655,522
3,655,523
67 3,655,524

**CLASS 204**

1R 3,655,525
1T 3,655,526
2 3,655,527
11 3,655,528
3,655,529
26 3,655,530
30 3,655,531
49 3,655,532
55R 3,655,533
55 3,655,534
59 3,655,535
3,655,536
60 3,655,537
114 3,655,538
128 3,655,539
143GE 3,655,540
159.2 3,655,542
180R 3,655,541
181 3,655,543
192 3,655,544
3,655,545
195 3,655,546
248 3,655,547
284 3,655,548
297R 3,655,549
302 3,655,550

**CLASS 206**

1R 3,655,034
47A 3,655,035
57A 3,655,036
63.5 3,655,037

**CLASS 208**

59 3,655,551

**CLASS 209**

5 3,655,038
74 3,655,039
75 3,655,040
81 3,655,041
91 3,655,042
138 3,655,043
167 3,655,044
379 3,655,045

**CLASS 210**

11 3,655,046
47 3,655,552
59 3,655,047
67 3,655,048
81 3,655,049
86 3,655,050
88 3,655,051
90 3,655,052
91 Re.27,326
152 3,655,053
169 3,655,054
225 3,655,055
227 3,655,056
288 3,655,057
360 3,655,058
446 3,655,059
493 3,655,060

**CLASS 211**

57 3,655,061
69.6 3,655,062
71 3,655,063
78 3,655,064
177 3,655,065

**CLASS 213**

100W 3,655,066

**CLASS 214**

1BB 3,655,070
1BT 3,655,069
1PB 3,655,067
1QD 3,655,068
2.5 3,655,071
6S 3,655,078
8.5A 3,655,072
16B 3,655,073
16.4A 3,655,074
38BA 3,655,076
38D 3,655,075
146.5 3,655,079
302 3,655,080
394 3,655,081
450 3,655,082

**CLASS 215**

11B 3,655,083
37R 3,655,084

**CLASS 219**

69C 3,655,936
89P 3,655,937
87 3,655,938
218 3,655,939
243 3,655,940
390 3,655,941
405 3,655,942
491 3,655,943

**CLASS 220**

1.5 3,655,087
3 3,655,085
9LG 3,655,086
9F Re.27,330
29 3,655,088
42A 3,655,089
3,655,090
54 3,655,091

**CLASS 221**

133 3,655,092

**CLASS 222**

1 3,655,093
3,655,094
39 3,655,095
82 3,655,096
129.4 3,655,097
135 3,655,098
153 3,655,099
182 3,655,100
317 3,655,104
326 3,655,101
484 3,655,102
3,655,105
530 3,655,103

**CLASS 224**

1A 3,655,106
30A 3,655,107
42.1E 3,655,077

**CLASS 226**

46 3,655,109

**CLASS 229**

2.5 3,655,110
7 3,655,111
14C 3,655,112
3,655,113
30 3,655,114
31R 3,655,115
39 3,655,116
40 3,655,117
62 3,655,118
72 3,655,119
86 3,655,120
92.8 3,655,121

**CLASS 233**

21 3,655,123
46 3,655,124

**CLASS 234**

115 3,655,126

**CLASS 235**

54R 3,655,125
61M 3,655,944
61.1 3,655,945
61.11E 3,655,949
61.7B 3,655,946
3,655,947
61.9R 3,655,948
92PE 3,655,950
92C 3,655,951
94R 3,655,952
137 3,655,953
150.1 3,655,954
150.52 3,655,955
151.11 3,655,957
151.3 3,655,956
151.35 3,655,958
153 3,655,959

**CLASS 237**

8 3,655,127

**CLASS 239**

3,655,128
60 3,655,129
77 3,655,130
124 3,655,131
206 3,655,132
226 3,655,122
265.31 3,655,133
265.37 3,655,134
310 3,655,135
452 3,655,136
670 3,655,137

**CLASS 240**

6.46 3,655,960
9A 3,655,961

**CLASS 241**

99 3,655,138
101 3,655,139

**CLASS 242**

18R 3,655,140
46.4 3,655,141
55 3,655,142
58.3 3,655,143
68 3,655,144
128 3,655,108
197 3,655,145

**CLASS 243**

35 3,655,146
3,655,153

**CLASS 244**

1N 3,655,147
3.22 3,655,148
42DA 3,655,149
53R 3,655,150
142 3,655,151
145 3,655,152

**CLASS 246**

182C 3,655,962

**CLASS 248**

27 3,655,154
38 3,655,155
48 3,655,156
97 3,655,157
154 3,655,158
188.1 3,655,159
188.8 3,655,160
354P 3,655,161

**CLASS 249**

219W 3,655,162

**CLASS 250**

41.9D 3,655,963
43.5D 3,655,964
45 3,655,965
49.5ZC 3,655,966
50 3,655,967
3,655,968
65R 3,655,971
65T 3,655,970
67 3,655,972
71.5S 3,655,973
3,655,974
80 3,655,978
83 3,655,975
83.3D 3,655,976
3,655,979
3,655,980
83.6S 3,655,977
106S 3,655,983
3,655,984
106T 3,655,981
3,655,982
108R 3,655,985
199 3,655,986
206 3,655,987
209 3,655,988
219LG 3,655,990
219WD 3,655,989

**CLASS 251**

45 3,655,163
347 3,655,164

**CLASS 252**

1 3,655,553
3 3,655,554
3,655,555
32.7HC 3,655,557
32.7E 3,655,556
33 3,655,558
47.5 Re.27,331
51.5A 3,655,559
3,655,560
3,655,561
3,655,562
59 3,655,563
62 3,655,564
63.2 3,655,565
95 3,655,566
3,655,567
99 3,655,568
3,655,569
132 3,655,570
148 3,655,571
171 3,655,572
180 3,655,573
301.2W 3,655,574
301.4S 3,655,577
301.6P 3,655,576
301.6S 3,655,575
313S 3,655,578
316 3,655,579
317 3,655,580
351 3,655,581
387 3,655,582
429A 3,655,584
431R 3,655,583
506 3,655,585
522 Re.27,332

**CLASS 254**

77 3,655,165

**CLASS 256**

35 3,655,167

**CLASS 259**

27 3,655,166
177 3,655,168

**CLASS 260**

2P 3,655,586
2.1R 3,655,587
2.5AM 3,655,588
2.5AS 3,655,590
2.5AZ 3,655,597
2.5FP 3,655,589
2.5B 3,655,592
3,655,600
2.5M 3,655,591
9 3,655,593
17R 3,655,594
18EP 3,655,595
18S 3,655,598
22R 3,655,596
23.7M 3,655,599
29.2M 3,655,602
29.3 3,655,603
29.6F 3,655,604
29.6M 3,655,605
32.6N 3,655,606
33.8R 3,655,607
37N 3,655,608
38 3,655,609
39R 3,655,610
41 3,655,611
41.5R 3,655,612
45.75K 3,655,613
3,655,616
45.9S 3,655,614
46.5E 3,655,615
47CB 3,655,619
47EN 3,655,617
47UP 3,655,618
3,655,727
75R 3,655,622
77.5AA 3,655,627
77.5AM 3,655,625
77.5AT 3,655,623
77.5CA 3,655,628
77.5NC 3,655,624
77.5Q 3,655,814
77.5 3,655,626
78 3,655,630
78.3R 3,655,631
78.4N 3,655,632
78.5R 3,655,629
79 3,655,633
3,655,634
94.9GC 3,655,834

97.7 3,655,635
112.5 3,655,636
149 3,655,637
153 3,655,638
3,655,639
162 3,655,640
176 3,655,641
194 3,655,642
210.5 3,655,643
233.3R 3,655,644
234R 3,655,645
239BB 3,655,651
239B 3,655,646
239.3B 3,655,648
239.3T 3,655,647
239.5 3,655,649
239.55C 3,655,652
239.55 3,655,650
3,655,653
240D 3,655,654
3,655,655
242 3,655,601
243C 3,655,656
3,655,658
243R 3,655,657
244R 3,655,659
247.1 3,655,661
3,655,663
247.2R 3,655,743
248CS 3,655,662
250A 3,655,660
251QA 3,655,664
260 3,655,665
268PH 3,655,666
3,655,667
3,655,668
281 3,655,669
283S 3,655,670
288R 3,655,671
289QP 3,655,672
293.61 3,655,674
293.66 3,655,673
293.67 3,655,680
293.74 3,655,675
293.84 3,655,676
294.8C 3,655,681
3,655,682
295AM 3,655,677
295R 3,655,678
3,655,679
299 3,655,683
304 3,655,686
306.8R 3,655,685
307C 3,655,687
307G 3,655,684
309.2 3,655,688
309.5 3,655,689
310R 3,655,690
326.3 3,655,691
332.2A 3,655,693
332.2C 3,655,692
340.5 3,655,695
343.2R 3,655,694
346.2 3,655,696
3,655,697
348.5V 3,655,698
396R 3,655,699
405 3,655,700
410.9R 3,655,701
412.6 3,655,702
429.7 3,655,703
3,655,705
429.9 3,655,704
433 3,655,707
437R 3,655,706
439R 3,655,708
448.2E 3,655,714
448.2N 3,655,711
3,655,712
3,655,713
448.2P 3,655,710
448.2T 3,655,709
453R 3,655,715
459 3,655,716
463 3,655,717
3,655,718
3,655,719
464 3,655,720
465.3 3,655,723
465.8 3,655,721
3,655,724
465.9 3,655,722
468R 3,655,725
3,655,726
473R 3,655,728
475P 3,655,729
479C 3,655,730
485H 3,655,731
486H 3,655,732
486 3,655,733
487 3,655,734
491 3,655,735
497R 3,655,736
501.17 3,655,737
502R 3,655,738
505C 3,655,739
509 3,655,740
517 3,655,741
518R 3,655,742
521R 3,655,744
526N 3,655,745
527N 3,655,746
530N 3,655,749
3,655,750
530R 3,655,747
534R 3,655,748
537N 3,655,620
545R 3,655,751
553D 3,655,756
558A 3,655,752
559R 3,655,753
561A 3,655,754
562B 3,655,755
564A 3,655,757
566AE 3,655,758
3,655,761
566A 3,655,759
3,655,760
570.8TC 3,655,762
576 3,655,763
584C 3,655,764
586R 3,655,765
3,655,766
592 3,655,767
593 3,655,768
597 3,655,769
600 3,655,770
603HF 3,655,771
607A 3,655,772
609A 3,655,774
609F 3,655,773
611A 3,655,775
613D 3,655,776
618H 3,655,777
619R 3,655,778
3,655,779
624E 3,655,780
643A 3,655,781
648R 3,655,782
650R 3,655,783
3,655,784
651F 3,655,785
653.3 3,655,786
656R 3,655,787
663 3,655,788
664 3,655,789
665R 3,655,790
666PY 3,655,796
666B 3,655,791
3,655,793
3,655,794
3,655,795
666P 3,655,792
3,655,799
668A 3,655,798
671B 3,655,801
671 3,655,797
3,655,800
672 3,655,802
675.5 3,655,803
677H 3,655,621
678 3,655,804
680E 3,655,805
681.5 3,655,806
683.15D 3,655,808
3,655,809
3,655,810
3,655,811
3,655,812
683.43 3,655,813
683.63 3,655,807
828 Re.27,328
830R 3,655,815
3,655,816
835 3,655,817
837 3,655,818
857TW 3,655,822
857 3,655,819
3,655,821
861 3,655,820
872 3,655,823
873 3,655,824
876R 3,655,825
3,655,826
880R 3,655,828
890 3,655,827
899 3,655,829
901 3,655,830
927R 3,655,831
930 3,655,832
948 3,655,833
983 3,655,835

CLASS 261

35 3,655,169
36A 3,655,170
64R 3,655,171
130 3,655,172

CLASS 263

8 3,655,173

CLASS 264

3 3,655,836
6 3,655,837
13 3,655,838
40 3,655,839
45 3,655,840
59 3,655,843
66 3,655,841
72 3,655,842
78 3,655,844
82 3,655,845
89 3,655,846
94 3,655,847
98 3,655,848
3,655,849
102 3,655,851
115 3,655,852
118 3,655,850
127 3,655,853
134 3,655,854
147 3,655,855
150 3,655,856
206 3,655,857
230 3,655,858
237 3,655,860
250 3,655,861
290 3,655,862
294 3,655,863

CLASS 266

21 3,655,174
22 3,655,175
38 3,655,176

CLASS 269

1 3,655,177
323 3,655,178
324 3,655,179

CLASS 270

58 3,655,180

CLASS 271

29 3,655,181
61 3,655,182
62 3,655,183
64 3,655,184
88 3,655,186

CLASS 272

82 3,655,185

CLASS 273

30 3,655,187
77A 3,655,188
88 3,655,189
95A 3,655,190
95R 3,655,191
101.1 3,655,192
106R 3,655,193
131B 3,655,194
135D 3,655,195
136F 3,655,196
138R 3,655,197
139 3,655,198
143R 3,655,199
148R 3,655,200
153R 3,655,201
176FA 3,655,202
181R 3,655,203

CLASS 274

14 3,655,325

CLASS 277

24 3,655,204
87 3,655,205
3,655,206
125 3,655,207
221 3,655,208
235B 3,655,210
235R 3,655,209
237 3,655,213

CLASS 280

11.13S 3,655,211
36R 3,655,212
43.23 3,655,214
79.2 3,655,215
150AB 3,655,217
150D 3,655,216
179 3,655,218
279 3,655,219
475 3,655,220
490 3,655,221

CLASS 282

11.5A 3,655,222

CLASS 285

39 3,655,223
93 3,655,224
311 3,655,225

CLASS 287

119 3,655,226
189.36F 3,655,227

CLASS 292

79 3,655,228
148 3,655,229
169 3,655,230

CLASS 293

86 3,655,231

CLASS 294

67R 3,655,232
118 3,655,233

CLASS 296

23MC 3,655,234
3,655,235
23F 3,655,236
28R 3,655,237
107 3,655,238

CLASS 297

331 3,655,239
379 3,655,240
408 3,655,241
445 3,655,242

CLASS 299

15 3,655,243
91 3,655,244

CLASS 302

59 3,655,245

CLASS 303

21F 3,655,246

CLASS 307

10R 3,655,991
87 3,655,992
88.3 3,655,993
132R 3,655,994
3,655,995
202 3,655,996
210 3,655,997
215 3,655,998
221R 3,655,999
233 3,656,000
235 3,656,001
3,656,002
238 3,656,003
246 3,656,004
247A 3,656,005
252M 3,656,006
262 3,656,007
268 3,656,008
3,656,009
279 3,656,010
304 3,656,011

CLASS 308

6C 3,655,247
9 3,655,248
72 3,655,249
160 3,655,250
183 3,655,251
236 3,655,252

CLASS 310

8.1 3,656,012
10 3,656,013
13 3,656,014
3,656,015
50 3,656,016
90 3,656,017
105 Re.27,337
242 3,656,018

CLASS 312

194 3,655,253
257 3,655,254

CLASS 313

217 3,656,019
346DC 3,656,020

CLASS 317

4 3,656,021
11C 3,656,022
13R 3,656,023
20 3,656,024
3,656,025
36TD 3,656,026
230 3,656,027
234R Re.27,325
3,656,029
3,656,030
235R 3,656,028
3,656,032
3,656,034
235 3,656,031
243 3,656,035
249D 3,656,033

CLASS 318

41 3,656,036
59 3,656,037
138 3,656,039
139 3,656,038
168 3,656,040
318 3,656,041
444 3,656,042
588 3,656,043

CLASS 320

2 3,656,044
34 3,656,045
59 3,656,046

CLASS 321

5 3,656,047

CLASS 322

19 3,656,048
27 3,656,049
28 3,656,050
3,656,051

CLASS 323

17 3,656,052

CLASS 324

20 3,656,053
29.5 3,656,061
37 3,656,054
61R 3,656,055
65R 3,656,056
133 3,656,057
158F 3,656,058
173 3,656,059
186 3,656,060

CLASS 325

362 3,656,062

CLASS 328

133 3,656,063

CLASS 329

104 3,656,064

CLASS 330

10 3,656,065

CLASS 331

65 3,656,066
94.5 3,656,067
3,656,068

CLASS 332

16R 3,656,069

CLASS 333

21A 3,656,070
26 3,656,071
31 3,656,179
71 3,656,180
97R 3,656,072

CLASS 335

179 3,656,073
205 3,656,181
206 3,656,074
219 3,656,075
240 3,656,076

CLASS 336

84 3,656,077

CLASS 337

70 3,656,078
102 3,656,079
111 3,656,080
319 3,656,182
346 3,656,081
366 3,656,082

CLASS 339

17CF 3,656,183
39 3,656,083
60R 3,656,084
91R 3,656,085
92M 3,656,086
95 3,656,087
98 3,656,088
110C 3,656,089
186M 3,656,090
198R 3,656,091
213T 3,656,092
217S 3,656,093
230C 3,656,094

CLASS 340

3R 3,656,095
5R 3,656,096
3,656,097
52D 3,656,098
53 3,656,101
62 3,656,099
63 3,656,100
64 3,656,102
67 3,656,103
95 3,656,104
119 3,656,105
146.1 3,656,106
3,656,107
3,656,108
146.2 3,656,109
149 3,656,110
3,656,111
151 3,656,112
153 3,656,113
164 3,656,114
166R 3,656,115
172.5 3,656,116
3,656,123
3,656,124
3,656,131
173FF 3,656,118
173LM 3,656,120
173RC 3,656,122
173SP 3,656,117
173R 3,656,119
3,656,121
174AN 3,656,128
174CR 3,656,129
174FB 3,656,126
174PW 3,656,127
174.1B 3,656,125
174.1C 3,656,130
189 3,656,132
207 3,656,133
244 3,656,134
248A 3,656,135
253R 3,656,136
259 3,656,137
266 3,656,138
267R 3,656,139
270 3,656,140
272 3,656,141
274 3,656,143
283 3,656,144
310 3,656,145
324A 3,656,146
3,656,147
3,656,148
324R 3,656,142
347AD 3,656,152
3,656,153
3,656,154
347DA 3,656,151
347DD 3,656,149
3,656,150
388 3,656,155
3,656,156
404 3,656,157
409 3,656,158

CLASS 343

6.8R 3,656,159
100PE 3,656,161
180 3,656,162
702 3,656,160
705 3,656,163
3,656,164
754 3,656,165
756 3,656,166
793 3,656,167
882 3,656,170
895 3,656,168

CLASS 346

1 3,656,169
3,656,171
74ES 3,656,173
74M 3,656,172
75 3,656,174
76L 3,656,175
145 3,656,176

CLASS 350

1 3,655,255
3.5 3,655,256
3,655,257
3,655,258
36 3,655,259
45 3,655,260
96WG 3,655,261
126 3,655,262
3,655,263
145 3,655,264
149 3,655,265
150 3,655,266
3,655,267
152 3,655,268
160 3,655,269
3,655,270
187 3,655,271
235 3,655,272
281 3,655,273
286 3,655,274
320 3,655,275

CLASS 351

30 3,655,276

CLASS 352

72 3,655,277
74 3,655,278

CLASS 353

27 3,655,279

CLASS 355

3 3,655,280
3,655,281
3,655,282
14 3,655,283
18 3,655,284
68 3,655,285
85 3,655,286
97 3,655,287

CLASS 356

87 3,655,288
201 3,655,289

CLASS 401

186 3,655,290
265 3,655,291

CLASS 402

63 3,655,292

CLASS 415

17 3,655,293
68 3,655,294
113 3,655,295

CLASS 416

72 3,655,297

CLASS 417

196 3,655,298
214 3,655,296
310 3,655,299
397 3,655,300

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 437 | 3,655,301 | 78 | 3,655,869 | 144 | 3,655,881 | 250 | 3,655,893 | 109 | 3,655,306 | 218 | 3,655,318 |
| | CLASS 418 | 80 | 3,655,870 | 147 | 3,655,882 | | 3,655,894 | | 3,655,307 | 267 | 3,655,319 |
| 61 | 3,655,302 | 89 | 3,655,871 | 157 | 3,655,883 | 251 | 3,655,895 | | 3,655,308 | 388 | 3,655,320 |
| | 3,655,303 | | 3,655,872 | 180 | 3,655,884 | | 3,655,896 | | 3,655,309 | 395 | 3,655,321 |
| 124 | 3,655,304 | 93 | 3,655,873 | 181 | 3,655,885 | 263 | 3,655,897 | | 3,655,310 | 431 | 3,655,322 |
| | CLASS 424 | 99 | 3,655,874 | 195 | 3,655,886 | | 3,655,898 | 115 | 3,655,311 | 438 | 3,655,323 |
| 38 | 3,655,864 | 106 | 3,655,875 | 229 | 3,655,887 | 273 | 3,655,899 | | 3,655,312 | | CLASS 431 |
| 45 | 3,655,865 | 117 | 3,655,876 | | 3,655,888 | | 3,655,900 | 130 | 3,655,313 | 258 | 3,655,324 |
| 48 | 3,655,866 | 121 | 3,655,877 | 238 | 3,655,889 | | 3,655,901 | 131 | 3,655,314 | | CLASS 444 |
| 52 | 3,655,867 | 122 | 3,655,878 | 244 | 3,655,890 | | CLASS 425 | 145 | 3,655,315 | 1 | 3,656,177 |
| 54 | 3,655,868 | | 3,655,879 | 249 | 3,655,891 | 83 | 3,655,305 | 161 | 3,655,316 | | 3,656,178 |
| | | | 3,655,880 | | 3,655,892 | | | 165 | 3,655,317 | | |

## CLASSIFICATION OF DESIGNS

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| D1— | 1 223,326 | | 223,344 | | 223,362 | | 223,380 | | 223,396 | D64— | 17 223,413 |
| D2— | 24 223,327 | | 223,345 | | 223,363 | 15 | 223,381 | | 223,397 | D71— | 1 223,414 |
| | 257 223,328 | 24 | 223,346 | 13 | 223,364 | D35— 3 | 223,379 | | 223,398 | D74— | 5 223,415 |
| | 310 223,329 | D15— | 1 223,347 | | 223,365 | D42— 7 | 223,382 | | 223,399 | D80— | 8 223,416 |
| | 374 223,330 | | 8 223,348 | 14 | 223,366 | D44— 1 | 223,383 | | 223,400 | D81— | 10 223,417 |
| D 5— | 4 223,331 | D16— | 2 223,349 | | 223,367 | | 223,384 | D49— 23 | 223,401 | D83— | 1 223,418 |
| D 8— | 83 223,333 | | 223,350 | | 223,368 | 26 | 223,385 | 30 | 223,402 | | 223,419 |
| | 138 223,332 | D18— | 223,351 | D30— 34 | 223,369 | D48— 16 | 223,386 | D52— | 2 223,403 | D85— | 2 223,420 |
| D 9— | 10 223,335 | | 223,352 | D33— 2 | 223,370 | 20 | 223,387 | | 6 223,404 | D86— | 10 223,421 |
| | 45 223,334 | D22— | 13 223,353 | 7 | 223,371 | 24 | 223,389 | D54— | 12 223,405 | | 223,422 |
| | 193 223,336 | | 25 223,355 | | 223,372 | | 223,390 | | 223,406 | | 11 223,423 |
| | 218 223,337 | | 27 223,354 | 19 | 223,373 | 27 | 223,391 | D61— | 1 223,407 | D87— | 1 223,424 |
| | 255 223,338 | D23— | 2 223,356 | | 223,374 | | 223,392 | | 223,408 | D89— | 1 223,425 |
| | 290 223,339 | | 14 223,357 | 24 | 223,375 | | 223,393 | | 223,409 | D90— | 20 223,426 |
| D13— | 1 223,340 | | 41 223,358 | 30 | 223,376 | 31 | 223,388 | | 223,410 | | 223,427 |
| D14— | 3 223,341 | D26— | 1 223,359 | D34— 5 | 223,377 | | 223,394 | | 223,411 | D94— | 3 223,428 |
| | 223,342 | | 5 223,360 | | 223,378 | | 223,395 | | 223,412 | D96— | 9 223,429 |
| | 223,343 | | 223,361 | | | | | | | | |

## CLASSIFICATION OF PLANTS

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| P. — 18 | 3,104 | P. — 24 | 3,103 | P. — 34 | 3,110 | P. — 47 | 3,106 | P. — | 3,109 | P. — 88 | 3,105 |
| P. — 22 | 3,111 | P. — 25 | 3,102 | P. — 37 | 3,107 | P. — 51 | 3,108 | | | | |

# GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)


| | | | | | |
|---|---|---|---|---|---|
| Alabama | 1 | Kentucky | 21 | Oregon | 41 |
| Alaska | 2 | Louisiana | 22 | Pennsylvania | 42 |
| American Samoa | 3 | Maine | 23 | Puerto Rico | 43 |
| Arizona | 4 | Maryland | 24 | Rhode Island | 44 |
| Arkansas | 5 | Massachusetts | 25 | South Carolina | 45 |
| California | 6 | Michigan | 26 | South Dakota | 46 |
| Canal Zone | 7 | Minnesota | 27 | Tennessee | 47 |
| Colorado | 8 | Mississippi | 28 | Texas | 48 |
| Connecticut | 9 | Missouri | 29 | Utah | 49 |
| Delaware | 10 | Montana | 30 | Vermont | 50 |
| District of Columbia | 11 | Nebraska | 31 | Virginia | 51 |
| Florida | 12 | Nevada | 32 | Virgin Islands | 52 |
| Georgia | 13 | New Hampshire | 33 | Washington | 53 |
| Guam | 14 | New Jersey | 34 | West Virginia | 54 |
| Hawaii | 15 | New Mexico | 35 | Wisconsin | 55 |
| Idaho | 16 | New York | 36 | Wyoming | 56 |
| Illinois | 17 | North Carolina | 37 | U.S. Air Force | 57 |
| Indiana | 18 | North Dakota | 38 | U.S. Army | 58 |
| Iowa | 19 | Ohio | 39 | U.S. Navy | 59 |
| Kansas | 20 | Oklahoma | 40 | | |


(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

## PATENTS

| | | | | | |
|---|---|---|---|---|---|
| 1 3,654,773 | 3,655,054 | 3,655,689 | 3,654,998 | 3,654,866 | 3,654,752 |
| 3,655,130 | 3,655,057 | 3,655,700 | 3,655,086 | 3,655,348 | 3,654,784 |
| 4 3,654,632 | 3,655,095 | 3,655,745 | 3,655,196 | 3,655,390 | 3,654,794 |
| 3,654,903 | 3,655,102 | 3,655,761 | 3,655,736 | 3,655,578 | 3,654,810 |
| 3,655,044 | 3,655,116 | 3,655,763 | 3,655,875 | 3,655,586 | 3,654,824 |
| 3,655,188 | 3,655,127 | 3,655,778 | 3,656,085 | 3,655,623 | 3,654,836 |
| 3,656,052 | 3,655,132 | 3,655,780 | 3,656,160 | 3,655,630 | 3,654,858 |
| 3,656,159 | 3,655,133 | 3,655,798 | 9 Re.27,326 | 3,655,635 | 3,654,863 |
| 5 3,655,112 | 3,655,155 | 3,655,814 | 3,654,645 | 3,655,657 | 3,654,876 |
| 3,655,219 | 3,655,159 | 3,655,889 | 3,654,688 | 3,655,664 | 3,654,879 |
| 6 Re.27,338 | 3,655,161 | 3,655,902 | 3,654,689 | 3,655,694 | 3,654,883 |
| 3,654,630 | 3,655,163 | 3,655,903 | 3,654,693 | 3,655,723 | 3,654,894 |
| 3,654,647 | 3,655,191 | 3,655,914 | 3,654,700 | 3,655,724 | 3,654,898 |
| 3,654,660 | 3,655,195 | 3,655,925 | 3,654,720 | 3,655,732 | 3,654,912 |
| 3,654,662 | 3,655,198 | 3,655,932 | 3,654,722 | 3,655,782 | 3,654,917 |
| 3,654,674 | 3,655,208 | 3,655,939 | 3,654,730 | 3,655,827 | 3,654,922 |
| 3,654,675 | 3,655,215 | 3,655,952 | 3,654,744 | 11 : 3,654,646 | 3,654,924 |
| 3,654,683 | 3,655,221 | 3,655,958 | 3,654,765 | 3,654,802 | 3,654,938 |
| 3,654,685 | 3,655,236 | 3,655,977 | 3,654,855 | 3,655,120 | 3,654,977 |
| 3,654,694 | 3,655,253 | 3,655,980 | 3,654,892 | 12 : 3,654,655 | 3,654,999 |
| 3,654,705 | 3,655,264 | 3,655,997 | 3,654,979 | 3,654,690 | 3,655,000 |
| 3,654,713 | 3,655,265 | 3,656,007 | 3,655,032 | 3,654,734 | 3,655,002 |
| 3,654,715 | 3,655,268 | 3,656,015 | 3,655,063 | 3,654,740 | 3,655,014 |
| 3,654,728 | 3,655,272 | 3,656,020 | 3,655,075 | 3,654,783 | 3,655,021 |
| 3,654,733 | 3,655,289 | 3,656,031 | 3,655,076 | 3,654,888 | 3,655,022 |
| 3,654,735 | 3,655,298 | 3,656,058 | 3,655,089 | 3,654,930 | 3,655,023 |
| 3,654,767 | 3,655,311 | 3,656,059 | 3,655,228 | 3,654,969 | 3,655,025 |
| 3,654,787 | 3,655,320 | 3,656,063 | 3,655,244 | 3,655,030 | 3,655,065 |
| 3,654,792 | 3,655,360 | 3,656,065 | 3,655,293 | 3,655,059 | 3,655,068 |
| 3,654,804 | 3,655,402 | 3,656,073 | 3,655,385 | 3,655,094 | 3,655,090 |
| 3,654,807 | 3,655,410 | 3,656,082 | 3,655,430 | 3,655,117 | 3,655,109 |
| 3,654,811 | 3,655,415 | 3,656,083 | 3,655,431 | 3,655,122 | 3,655,111 |
| 3,654,814 | 3,655,434 | 3,656,091 | 3,655,448 | 3,655,187 | 3,655,121 |
| 3,654,817 | 3,655,442 | 3,656,101 | 3,655,496 | 3,655,308 | 3,655,145 |
| 3,654,821 | 3,655,469 | 3,656,115 | 3,655,537 | 3,655,495 | 3,655,156 |
| 3,654,822 | 3,655,503 | 3,656,128 | 3,655,579 | 3,655,594 | 3,655,162 |
| 3,654,832 | 3,655,515 | 3,656,130 | 3,655,606 | 3,655,803 | 3,655,164 |
| 3,654,850 | 3,655,517 | 3,656,136 | 3,655,622 | 3,656,080 | 3,655,184 |
| 3,654,852 | 3,655,541 | 3,656,139 | 3,655,830 | 3,656,163 | 3,655,185 |
| 3,654,904 | 3,655,546 | 3,656,141 | 3,655,876 | 13 : 3,654,701 | 3,655,189 |
| 3,654,914 | 3,655,547 | 3,656,146 | 3,655,891 | 3,655,114 | 3,655,212 |
| 3,654,915 | 3,655,550 | 3,656,152 | 3,655,908 | 3,655,149 | 3,655,217 |
| 3,654,948 | 3,655,551 | 3,656,158 | 3,655,915 | 3,655,417 | 3,655,282 |
| 3,654,963 | 3,655,566 | 3,656,164 | 3,656,014 | 3,655,790 | 3,655,283 |
| 3,654,974 | 3,655,572 | 3,656,175 | 3,656,057 | 16 : 3,656,048 | 3,655,285 |
| 3,654,985 | 3,655,595 | 3,656,183 | 3,656,061 | 17 : Re.27,334 | 3,655,325 |
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| 3,655,008 | 3,655,616 | 8 : 3,654,649 | 3,656,120 | 3,654,665 | 3,655,365 |
| 3,655,009 | 3,655,621 | 3,654,710 | 3,656,138 | 3,654,668 | 3,655,376 |
| 3,655,020 | 3,655,625 | 3,654,726 | 3,656,156 | 3,654,669 | 3,655,411 |
| 3,655,052 | 3,655,680 | 3,654,932 | 10 : 3,654,652 | 3,654,707 | 3,655,414 |

3,655,476
3,655,477
3,655,484
3,655,539
3,655,562
3,655,602
3,655,702
3,655,704
3,655,731
3,655,734
3,655,751
3,655,791
3,655,797
3,655,811
3,655,868
3,655,882
3,655,892
3,655,906
3,655,918
3,655,919
3,655,920
3,655,945
3,655,974
3,655,994
3,655,995
3,656,005
3,656,016
3,656,023
3,656,047
3,656,089
3,656,104
3,656,134
3,656,181
18 : Re.27,329
3,654,629
3,654,636
3,654,641
3,654,751
3,654,805
3,654,973
3,655,223
3,655,224
3,655,234
3,655,359
3,655,443
3,655,513
3,655,563
3,655,656
3,655,666
3,655,781
3,655,788
3,655,850
3,655,854
3,655,881
3,656,076
3,656,096
3,656,135
3,656,151
19 : 3,654,731
3,654,885
3,655,101
3,655,138
3,655,315
3,655,321
3,655,644
20 : 3,654,966
3,655,290
3,655,294
3,656,094
3,656,110
21 : 3,654,772
3,654,907
3,655,027
3,655,131
3,655,235
3,655,526
3,656,182
22 : 3,654,666
3,655,413
3,655,435
3,655,520
3,655,701
23 : 3,654,851
3,655,128
24 : 3,654,759
3,654,921
3,655,051
3,655,214
3,655,274
3,655,330
3,655,405
3,655,508
3,655,524
3,655,626
3,655,690
3,655,715
3,655,754
3,656,025
3,656,095
3,656,111
25 : Re.27,335
3,654,637
3,654,748
3,654,798
3,654,846
3,654,848

3,654,857
3,654,902
3,654,947
3,655,037
3,655,058
3,655,079
3,655,126
3,655,136
3,655,201
3,655,243
3,655,266
3,655,277
3,655,424
3,655,427
3,655,432
3,655,441
3,655,444
3,655,447
3,655,474
3,655,494
3,655,585
3,655,764
3,655,842
3,655,911
3,655,975
3,655,986
3,656,050
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3,656,056
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3,656,072
3,656,087
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3,656,113
3,656,126
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3,656,132
3,656,149
3,656,172
26 : Re.27,327
Re.27,339
3,654,639
3,654,643
3,654,736
3,654,762
3,654,764
3,654,770
3,654,797
3,654,801
3,654,816
3,654,820
3,654,826
3,654,827
3,654,864
3,654,878
3,654,926
3,654,958
3,654,980
3,655,010
3,655,034
3,655,070
3,655,113
3,655,202
3,655,203
3,655,206
3,655,209
3,655,225
3,655,227
3,655,238
3,655,240
3,655,249
3,655,273
3,655,291
3,655,299
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3,655,333
3,655,395
3,655,440
3,655,458
3,655,516
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3,655,598
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3,655,705
3,655,713
3,655,733
3,655,773
3,655,885
3,655,928
3,655,929
3,655,969
27 : 3,654,738
3,654,777
3,654,853
3,654,875
3,654,880
3,654,910
3,654,933
3,655,050
3,655,096
3,655,181

3,655,279
3,655,347
3,655,383
3,655,565
3,655,727
3,655,728
3,655,758
3,655,818
3,655,927
3,656,060
3,656,088
3,656,109
28 : 3,655,081
3,655,165
29 : 3,654,672
3,654,698
3,654,754
3,654,795
3,654,830
3,654,870
3,654,871
3,654,984
3,655,046
3,655,261
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3,656,102
30 : 3,654,872
31 : 3,655,077
3,655,478
33 : 3,655,192
3,655,247
3,655,940
34 : Re.27,330
Re.27,332
3,654,640
3,654,706
3,654,708
3,654,727
3,654,786
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3,654,856
3,654,882
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3,654,927
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3,655,088
3,655,091
3,655,093
3,655,118
3,655,169
3,655,171
3,655,173
3,655,177
3,655,218
3,655,231
3,655,237
3,655,255
3,655,295
3,655,302
3,655,351
3,655,367
3,655,378
3,655,403
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3,655,659
3,655,667
3,655,679
3,655,692
3,655,693
3,655,695
3,655,696
3,655,697

3,655,698
3,655,699
3,655,716
3,655,722
3,655,777
3,655,786
3,655,807
3,655,812
3,655,822
3,655,828
3,655,838
3,655,852
3,655,855
3,655,857
3,655,865
3,655,888
3,655,890
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3,655,897
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3,655,912
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3,655,953
3,655,993
3,656,002
3,656,011
3,656,024
3,656,030
3,656,045
3,656,062
3,656,068
3,656,069
3,656,071
3,656,084
3,656,100
3,656,108
3,656,121
3,656,122
3,656,161
3,656,170
3,656,173
35 : 3,655,151
36 : 3,654,635
3,654,642
3,654,658
3,654,709
3,654,716
3,654,718
3,654,729
3,654,732
3,654,743
3,654,835
3,654,844
3,654,847
3,654,893
3,654,900
3,654,901
3,654,935
3,654,939
3,654,943
3,654,959
3,654,960
3,654,975
3,654,976
3,655,031
3,655,033
3,655,036
3,655,045
3,655,048
3,655,069
3,655,085
3,655,100
3,655,105
3,655,115
3,655,119
3,655,123
3,655,125
3,655,135
3,655,140
3,655,152
3,655,183
3,655,194
3,655,197
3,655,200
3,655,204
3,655,211
3,655,222
3,655,229
3,655,257
3,655,262
3,655,267
3,655,276
3,655,280
3,655,281
3,655,284
3,655,288
3,655,331
3,655,335
3,655,338
3,655,361
3,655,366
3,655,368
3,655,370
3,655,371

3,655,372
3,655,373
3,655,374
3,655,375
3,655,377
3,655,379
3,655,380
3,655,381
3,655,382
3,655,392
3,655,393
3,655,394
3,655,397
3,655,398
3,655,399
3,655,400
3,655,401
3,655,404
3,655,407
3,655,409
3,655,423
3,655,425
3,655,451
3,655,457
3,655,462
3,655,463
3,655,464
3,655,465
3,655,472
3,655,473
3,655,482
3,655,487
3,655,488
3,655,490
3,655,497
3,655,531
3,655,544
3,655,573
3,655,603
3,655,614
3,655,618
3,655,627
3,655,640
3,655,669
3,655,675
3,655,677
3,655,691
3,655,703
3,655,752
3,655,753
3,655,765
3,655,767
3,655,769
3,655,832
3,655,861
3,655,866
3,655,883
3,655,901
3,655,904
3,655,907
3,655,916
3,655,955
3,655,960
3,655,970
3,655,971
3,655,972
3,655,999
3,656,004
3,656,018
3,656,028
3,656,029
3,656,034
3,656,035
3,656,046
3,656,064
3,656,078
3,656,105
3,656,107
3,656,117
3,656,118
3,656,119
3,656,123
3,656,144
3,656,148
3,656,154
3,656,162
37 : 3,654,654
3,654,677
3,654,699
3,654,937
3,655,107
3,655,353
3,655,720
3,655,859
3,655,893
3,656,179
39 : Re.27,328
Re.27,331
3,654,650
3,654,659
3,654,661
3,654,664
3,654,680
3,654,681
3,654,717
3,654,768

3,654,790
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3,654,833
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3,654,971
3,654,972
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3,655,019
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3,655,067
3,655,074
3,655,083
3,655,104
3,655,153
3,655,158
3,655,160
3,655,186
3,655,190
3,655,193
3,655,200
3,655,275
3,655,286
3,655,307
3,655,317
3,655,324
3,655,343
3,655,354
3,655,357
3,655,421
3,655,453
3,655,468
3,655,481
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3,655,530
3,655,534
3,655,538
3,655,556
3,655,599
3,655,708
3,655,729
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3,655,831
3,655,837
3,655,843
3,655,847
3,655,921
3,655,926
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## Design Patents

6 : 223,342
223,343
223,344
223,353
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223,338
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223,401
223,411
223,421
36 : 223,340
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223,372
223,378
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223,383
223,428
37 : 223,350
223,394
38 : 223,418
39 : 223,339
223,413
41 : 223,403
42 : 223,332
223,376
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44 : 223,417
48 : 223,336
223,358
49 : 223,349
53 : 223,341
223,348
223,388
223,395
223,396
223,397
223,398
223,399
223,400
223,419

## Plant Patents

6 : 3,102
6 : 3,106
12 : 3,105
13 : 3,110
34 : 3,108
36 : 3,109
39 : 3,107

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